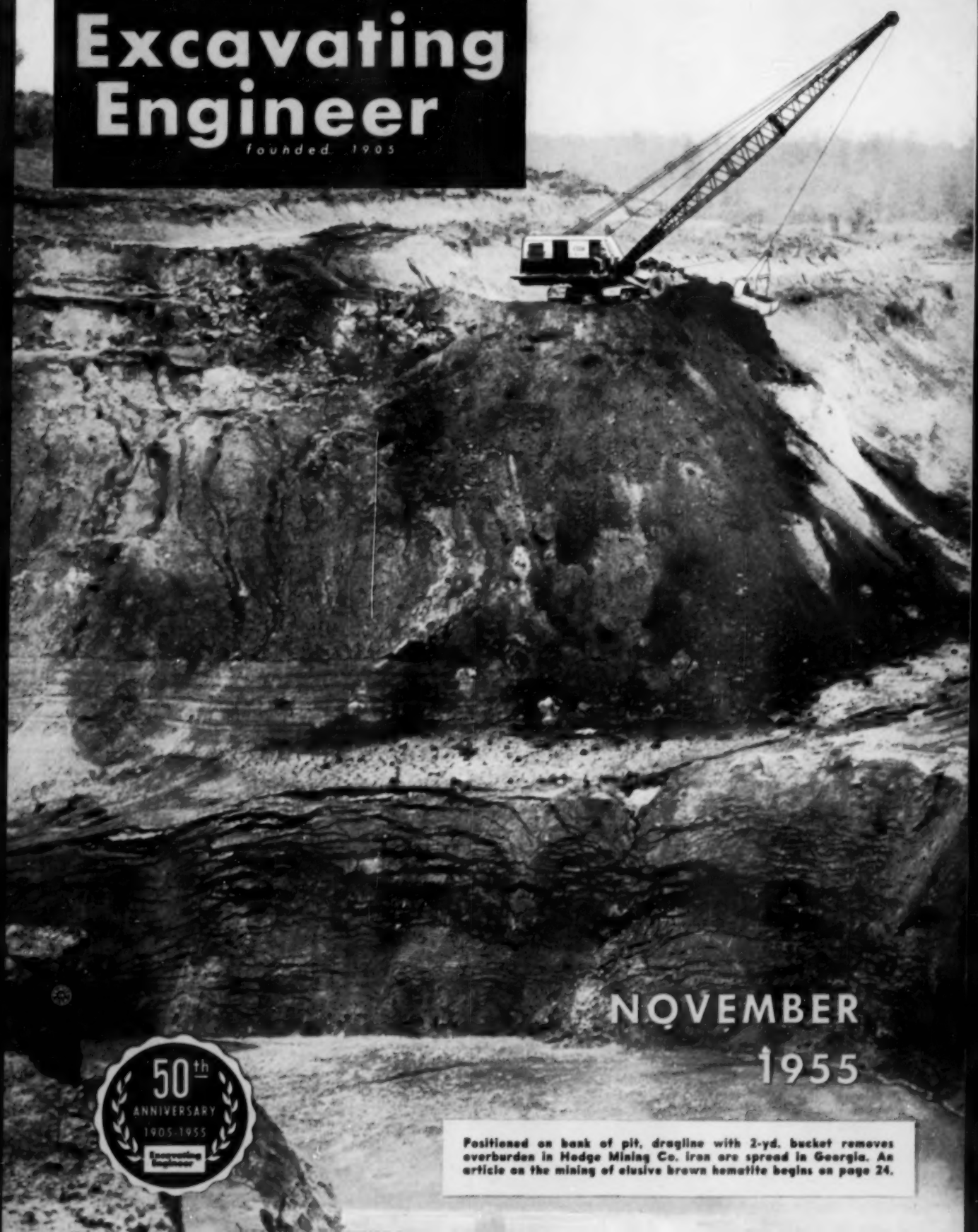
Excavating Engineer

founded 1905



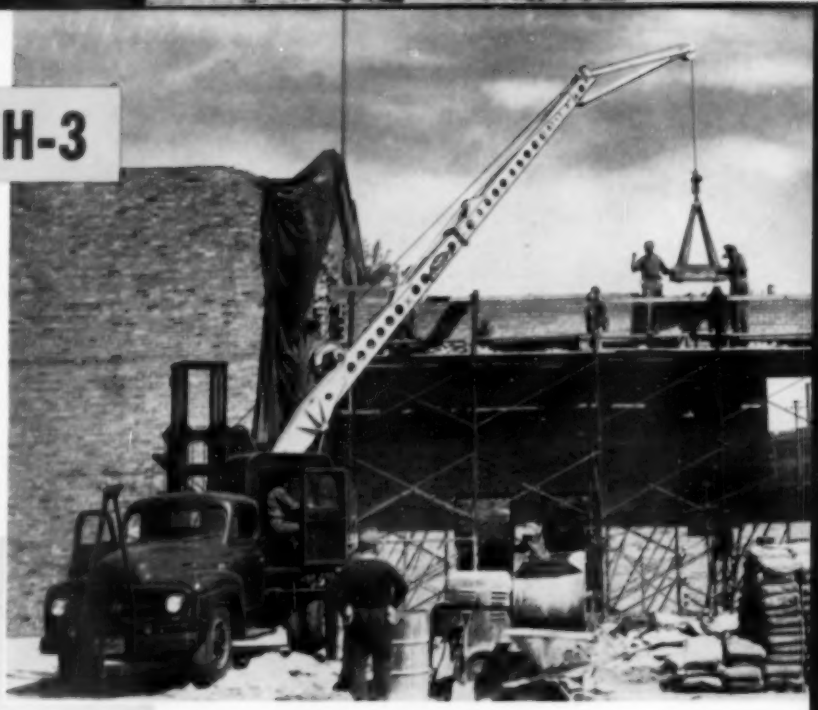
NOVEMBER
1955

50th ANNIVERSARY 1905-1955 Excavating Engineer

Positioned on bank of pit, dragline with 2-yd. bucket removes overburden in Hodge Mining Co. iron ore spread in Georgia. An article on the mining of elusive brown hematite begins on page 24.

Versatile speedster — Here an H-3 Hydrocrane erects concrete planking. Smooth, exact control reduces possibility of damage to planking, permits operator to set a steady, big output pace.

H-3



Pictured is the new H-5 Hydrocrane pouring concrete for a laundry building under construction. Nine-ton capacity as a crane, ½-yd. as an excavator, yet it mounts on a *conventional truck, new or used, without sacrificing* work capacity. You can choose the truck that fits your needs best.

H-5

Now!

BUCYRUS-ERIE HYDROCRANES IN TWO FAST-TRAVELING, SMOOTH-WORKING MODELS

Choose the Hydrocrane that's best for your jobs. Bucyrus-Erie now offers this multi-job, all-hydraulic truck-crane in *two* popular sizes. First there's the 4-ton, ⅜-yd. H-3 — a long-standing favorite among users on a wide variety of erecting and digging jobs . . . available with 18- to 26-ft. standard telescoping boom or 30- to 38-ft. erector's boom.

And now Bucyrus-Erie brings you the new higher-reaching, bigger-digging, 9-ton, ½-yd. H-5 Hydrocrane. Standard boom telescopes hydraulically from 24 to 36 feet, high-lift boom from 38 to 50 feet — and can be retracted to 25 feet for travel. Both models bring you all the operating advantages of full hydraulic control of all work functions, 45- to 50-mph top travel speed, exceptional ability for working and maneuvering in close quarters.

For some users the Model H-3 is still the best buy; for others the greater capacity and long boom reach of the H-5 open the way to bigger savings on more jobs. Your Bucyrus-Erie distributor can help you choose the right one for your specific needs. See him now for full details.

109H55C

BUCYRUS ERIE

South Milwaukee Wisconsin

1880 75 1955

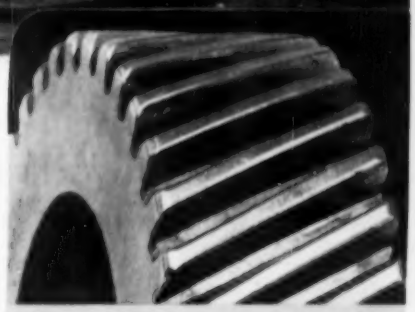
YEARS OF SERVICE to Men Who Shape the Earth

Can you tell which Gear will deliver Trouble-Free Service?

MAYBE YOU CAN'T...BUT YOUR BUDA ENGINE CAN!

Two replacement crankshaft gears may *look* alike—but when one of them is a genuine Buda replacement part and the other a "will-fit"—there's a powerful difference! The Buda gear will be the *exact* part your particular engine requires . . . it will be made to carefully controlled tolerances and of material specifically developed to meet our standards. Once it's installed you'll know the difference, because your engine will operate at maximum efficiency and *continue* to deliver profitable horsepower hours for years to come.

Any replacement part—whether it's a gear, filter, a piston, set of rings, or a gasket—will give you the performance and service life you expect if it's a genuine Buda part. Be sure the parts installed in your Buda engines are genuine Buda parts . . . it pays in the long run.



Close-up photo of a "will-fit" crankshaft gear after 2000 hours of operation. Tooth surfaces and shoulders worn so badly that replacement was necessary.

This Buda crankshaft gear, taken from an engine after 3000 hours of operation, shows no appreciable wear, and could be re-installed in the engine.

See your nearby Buda Division Engine Distributor for any Buda replacement part you need. His stocks are complete and ready for immediate delivery.

BUDA DIVISION • HARVEY, ILLINOIS

ALLIS-CHALMERS

BC-35

Wire rope lasts as long as the wire it's made of!

ROEBLING'S NEW ROPE WIRE

1105

HAS THE CAPACITY TO ENDURE...
AND

Royal Blue

WIRE ROPE
IS MADE OF 1105!

Write us for full facts on the all-steel Royal Blue Wire Rope, or contact your Roebling distributor

JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 19325 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK 6, N. Y.

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Excavating Engineer

founded 1905

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MORE DRIVE for your diesel!

Here is how the application of AiResearch Turbochargers can affect the performance of your mobile or stationary diesel equipment:

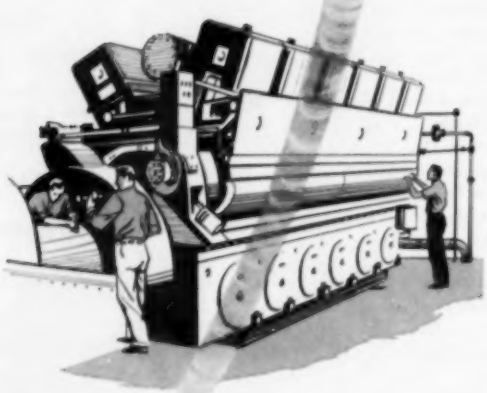
✶ Adds more power in relation to size and weight than any other units in this field.

✶ Decreases fuel consumption. Besides decreasing costs, this factor greatly increases the non-refueling range for mobile equipment.

✶ Provides power as needed by responding rapidly to acceleration requirements. This factor greatly decreases smoking.

✶ Maintains sea-level power under all altitude conditions.

✶ Greatly reduces the noise level of your equipment while eliminating power-wasting mufflers.



AiResearch is the largest producer of small turbomachinery in the United States. Twenty-five *million* hours of experience in deriving exceptional power from small units is the background for the development of the AiResearch Turbocharger. This power package was recently applied to Caterpillar diesel machinery with startlingly effective results.

Your inquiries are invited.

THE GARRETT CORPORATION

AiResearch Industrial Division

9225 Aviation Blvd., Los Angeles 45, California

DESIGNERS AND MANUFACTURERS OF TURBOCHARGERS AND RELATED MACHINERY

WHY BE SATISFIED WITH LESS THAN ALL NORTHWEST ADVANTAGES?

- "Feather-Touch" Clutch Control makes operation easy without complicated, delicate mechanisms.
- Wide range of Boom Hoist Equipment, including self-locking worm or independent high-speed boom hoists.
- Uniform Pressure Swing Clutches take the jerks and grabs out of swinging.
- Ball and roller bearings on all high-speed shafts (standard on Northwests since the first one was built).
- Cast Machinery Bases and Machinery Side Frames for permanent shaft alignment.
- Helical gear drive running in oil—the finest thing in gearing.
- Traction and steering that gets you there—and back. Travel gears fully enclosed and running in oil.
- Fully convertible to Dragline, Shovel and Pullshovel by simply changing booms.
- Northwest Dual Independent Shovel Crowd that utilizes force most independent crowd shovels waste.
- Cushion Clutch eliminates effects of shock overloads to parts under power before overload reaches machinery.

A piece of equipment represents a package of advantages that, when properly applied, will make money for you! The more advantages you get, the more versatile the equipment—and the easier it will be to make money with it.

Northwest Crawler and Truck Mounted Shovels, Cranes, Draglines and Pullshovels bring you a combination of advantages that have been proved over the years as real money makers. They combine to give a smoothness of operation, easier upkeep and a versatility that has established them not as just a "Good Shovel," a "Good Crane" but as an outstanding leader whether equipped as a *Shovel, Crane, Dragline or Pullshovel.* Don't be satisfied with less than ALL Northwest Advantages. Ask a Northwest Man to go over the *full* list with you.

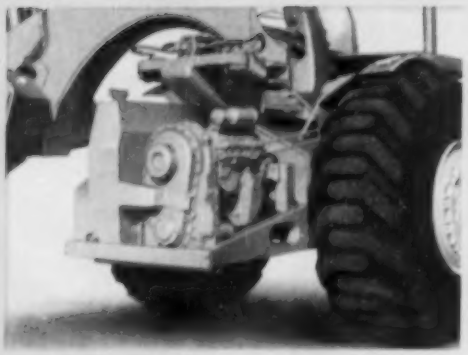
NORTHWEST ENGINEERING COMPANY
1506 Field Building, 135 South LaSalle Street
Chicago 3, Illinois

YOU CAN'T HAVE NORTHWEST ADVANTAGES UNLESS YOU OWN A NORTHWEST

NORTHWEST

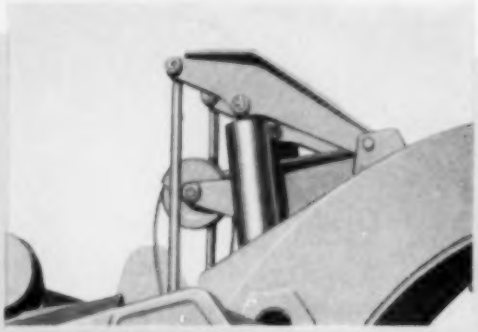
CRAWLER and TRUCK MOUNTED SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

MORE WORKABILITY WITH



ACCESSIBILITY

Accessibility of major components is a cost saving feature of these two new Euclid Scrapers. Easy servicing and maintenance means more working time and more payloads per day. Engine, transmission, drive axle and entire hydraulic system can be serviced or replaced in about half the time required on other scrapers. Illustration shows accessibility of the Torqmatic Drive in the S-18 Scraper.



ADVANCED DESIGN

Euclid's advanced design does away with cable headaches—costly downtime for replacement and repair. All scraper operations . . . bowl, apron and ejector . . . are actuated by husky levers with independent hydraulic control. They're fast and positive . . . not interconnected in any way. All four hydraulic jacks are interchangeable . . . one spare fits anywhere!

Performance that gets More Work Done!

CUTTING BLADES

The cutting blade is another reason you can count on lower maintenance costs with "Euc" Scrapers. All four sections are identical and reversible. By using a straight or drop center blade arrangement you get the most efficient loading under any job condition. Reversing or interchanging the sections . . . a very easy operation . . . provides a completely new cutting edge.

The S-12 has plenty of power and traction to pick up heaped loads in a hurry, even in sandy conditions like this.

With Torqmatic Drive and 300 h.p., the S-18 hauls heaped loads up to 24 cu. yds. at fast travel speeds . . . dumps on the fly.

NEW "EUC" SCRAPERS

THE S-12

12 yds. struck . . .
14 yds. at 3:1 slope . . . 16 yds. heaped at 1:1 . . . 26.5 x 25 tires . . . 218 h.p. . . . top speed loaded of 28 mph. . . . 9' 6" width of cut . . . makes non-stop 180° turn in 31'.

AND THE S-18

These two new Euclid Scrapers bring you a new high in scraper performance and low cost yardage. Both incorporate the advanced design that have made "Euc" Scrapers the fastest growing line in the industry. With lever action and 4 section cutting blades, and 16 to 18 h.p. per yd. of capacity, they load easy and travel fast. The entire power train of the S-12 and the S-18 is designed for exceptionally good accessibility.

Before you decide on any scraper for your present or future work, check the money saving features of these "Eucs". Your Euclid dealer will be glad to give you facts and figures that show why so many users have found that ***Euclids are your best investment.***

18 yds. struck . . .
21 yds. heaped at 3:1 slope . . . 24 yds. heaped at 1:1 . . . 27.00 x 33 tires . . . 300 h.p. . . . Torqmatic Drive with torque converter and semi-automatic transmission . . . top speed of 20 mph with full payload . . . 10' width of cut . . . makes non-stop 180° turn in only 36'.

EUCLID DIVISION
GENERAL MOTORS CORPORATION
Cleveland 17, Ohio

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

GM GENERAL MOTORS

The LINE forms on the RIGHT!

For these NEW PAYLOADER® tractor shovels

We anticipated some of this demand....

But apparently not enough. . . .

We're increasing our production....

We're expanding our facilities. . . .

However, since these new models outproduce and outperform other tractor-shovels, we expect the demand to increase even more. If you are interested in more production at lower costs, your future needs will probably include one or more of these new "PAYLOADER" models.

Because of the current demand we suggest you contact your "PAYLOADER" distributor *at once* and discuss your needs with him.

These new models have been designed and are being built by The Frank G. Hough Co. who introduced the first four-wheel-drive tractor-shovel and who have produced more unit-design tractor-shovels than all other firms put together.

model HU *1 cu. yd.*

model HH *1½ cu. yd.*

model HO *2 cu. yd.*

The complete proven "PAYLOADER" line of tractor-shovels includes sizes ranging from 18 cu. ft. to 2 cu. yd. bucket capacity and available in four wheel drive, rear wheel drive and front wheel drive types. They are sold and serviced by the largest, most experienced Distributor organization in the business.

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

THE FRANK G. HOUGH CO.
708 Sunnyside Ave., Libertyville, Ill.

Send information on "PAYLOADER"
☐ model HU ☐ model HH ☐ model HO

Name.....
Title.....
Firm.....
Street.....
City.....
State.....

Wire Rope at Work — This is part of the steelwork for a brand-new building on New York's East Side. It will be a beautiful multicolored structure topped by a striking blue tower. When completed, the building is to be known as 711 Third Avenue. "711" will usher in an era. It is expected to pioneer an exciting period of new construction on Third Avenue — a development forecast by the razing of the elevated railway.

As the steelwork for 711 went up, Bethlehem wire rope was much in evidence. You see some of it in the photograph: that hoist line, for instance, descending from the derrick boom. The rope was Purple Strand, of course, Bethlehem's toughest grade, and it handled those heavy structural members as if they were straws. A typical assignment for Purple Strand, one duplicated many times a year in every part of the country.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

CONSTRUCTION • MINING • PETROLEUM • EXCAVATING • QUARRYING • LOGGING • MANUFACTURING

Word to Contractors:

"Get It Done for the Cash-Paying Drivers"

Need quick money return from Kentucky Turnpike

Tyler & Breslin's 2½-yd. Bucyrus-Erie 54-B drops a full load to rear-dump near Okolona, Kentucky.

Kentucky saw the need for speed when it entered the turnpike picture. It sold $38½ million in bonds to pay for a 38-mile Louisville-Elizabethtown Turnpike. The loan was made midway through 1954. Engineering surveys predicted plenty of vehicles would use the highway, starting with 3 million in 1956 and climbing to 6 million in 25 years. The road would pay.

The problem was to get cash customers on the turnpike quickly. Engineers thought the job should be done in one year. The all-out construction effort got under way in January, 1955.

South of Lebanon Junction, the R. R. Dawson Bridge Company's 22-B clamshell digs bridge footings.

A 1½-yd. Bucyrus-Erie 38-B helps cut down a hill on Turnpike's Section 1C.

PROVEN RIGS STEP IN

Kentucky awarded the job to experienced, able contractors who were the best bet for getting the job done well and fast. These firms, in turn, called on skilled men and the finest, modern construction machines.

Wherever you see the tough, time-fighting turnpike jobs going on, you'll see plenty of Bucyrus-Erie excavators. These rigs have proved themselves over the past 75 years in everything from rock to iron ore. They're *ready* for today's tight-scheduled and big-output-demanding turnpikes.

A MORAL HERE

Take the Kentucky Turnpike. Ten Bucyrus-Eries were on the job, ranging in size from the ¾-yd. 22-B to one of the newest machines in the line, the torque-converter-equipped 3-yard, 71-B.

You want the big yardages these turnpike builders get. Rely on the same equipment. Put Bucyrus-Eries to work for you. 185E55C

A 2½-yd. Bucyrus-Erie 54-B dragline loads fill for Turnpike Contractor, L. G. Wasson Coal Mining Company.

Working on the Turnpike's biggest rock cut — a one million yarder near Elizabethtown — is this 3-yd. torque-converter-equipped Bucyrus-Erie 71-B.

BUCYRUS ERIE

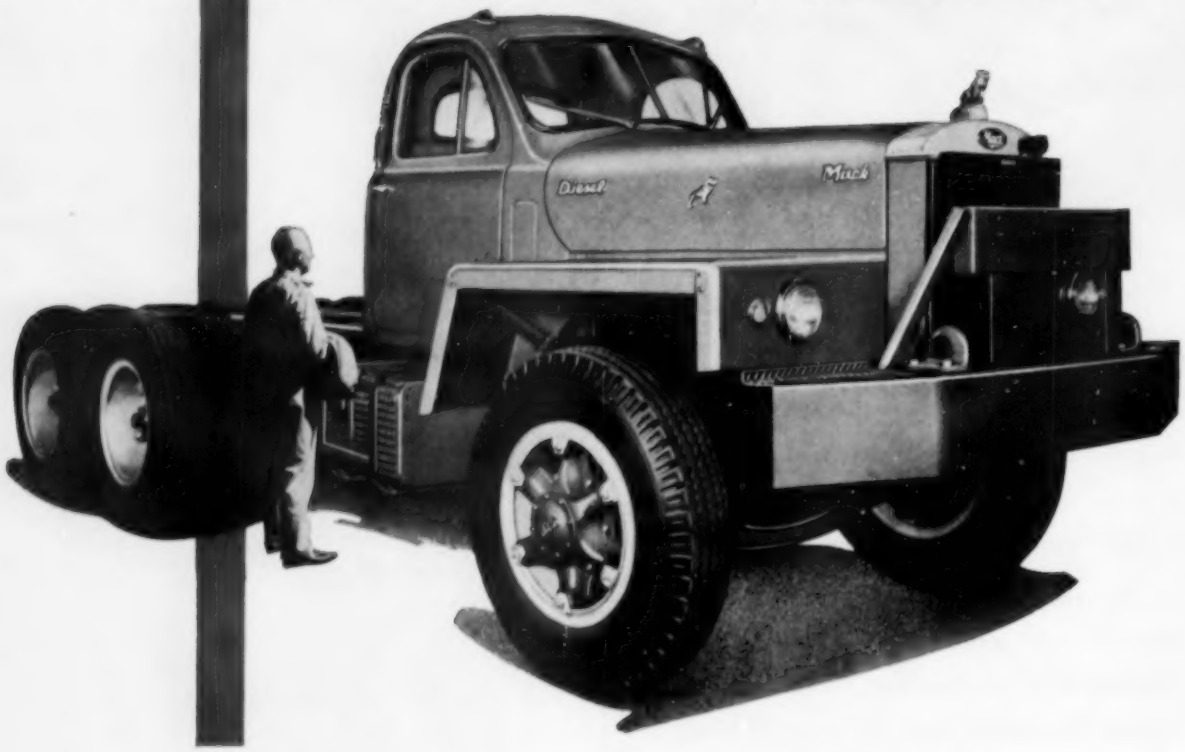
South Milwaukee Wisconsin

1880 75 1955

YEARS OF SERVICE to Men Who Shape the Earth

NEW Mack B-80 SERIES—

a money-making giant for heavy construction



New features make this rugged six-wheeler more powerful, sturdier . . . and a greater work producer than even its great Mack predecessors!

GREATER DIESEL POWER. Mack's famous Thermodyne® Diesel is now turbo-charged to 205 h.p.; other turbo-charged diesel power up to 262 h.p. is available.

MORE BRAKING POWER. Mack Thermodyne Diesel engines are recognized as having more braking power than any other. Now new exhaust brakes increase their retardation by 50%, while adding greatly to brake lining life.

NEW TRANSMISSIONS. From 10 to 20 speeds, with a wide range of options of final drive ratios to meet any operating conditions. Complete one-box units—no auxiliary transmissions or two-speed axles are necessary.

SQUARE-CUT MILITARY FENDERS. Make the Mack B-80 series look even more like the sturdy work-champions they are! Functional too—they provide strong, steady working platforms.

IMPROVED MACK BALANCED BOGIE. Assures positive traction no matter what the load or terrain. Mack's exclusive Power Divider delivers torque to each wheel in proportion to its traction, eliminating useless wheel slippage and spinning.

UNITIZED CABS. Roomier, stronger, thoroughly ventilated Mack "B" cabs are more comfortable and fully accessible. "Unitized" construction—radiator, fenders and cab mounted as integral unit at 4 points—means longer cab life, greater stability.

FULL RANGE. 11 models to choose from, giving you a complete selection of sizes and capacities to meet your own needs exactly.

You get *more* power—*greater reserve* power—to pull through with any load, on the tightest schedules when you put new Mack B-80's on your jobs. And you get all the features that you need for top efficiency and performance in the field, too! For the full story, see your Mack branch or distributor.

3471

MACK TRUCKS **Empire State Building, New York 1, N. Y.**

Tractor-on-rubber spreads 30 to 35 truck-loads hourly for New York Thruway

To speed their work on the Herkimer Section of the New York Thruway, east of Utica, L. G. DeFelice & Son, Inc., North Haven, Connecticut, brought in a 186 hp rubber-tired Tournatractor.

360 to 420 yards hourly

This new unit is now helping move 4,000,000 yards of sand, clay, earth and shale. Some of the time, it works alongside the Erie Canal, where a dragline is excavating 15 to 20′ of muck to provide a stable base for the road. Tournatractor's job here is to backfill sand and gravel brought in by dump trucks. In typical operation, it spreads 30 to 35 loads (360 to 420 yards) hourly. Pushes vary from a few feet to 300 feet one-way. Dozer loads average 2½ yards each. Compaction is attained by rolling action of tires, plus back-blading with down-pressure on return portion of each cycle.

All-purpose tool

When caught up on this phase of the work, Tournatractor speeds at 19 mph to handle a wide variety of odd-lot assignments. In addition to backfilling, it helps other tractors spread scraper-dumped dirt . . . tows compressors and other equipment . . . cleans haul roads . . . and pushes or pulls trucks out of the mud. In final stages of earthmoving, Tournatractor will tow a 50-ton rubber-tired compactor.

"I like the Tournatractor very much as a push-tractor," says Foreman James Perkins. "It's also tops for spreading truck-dumped loads."

"I like Tournatractor's maneuverability," says Operator Charles L. Curran. "That down-pressure is really okay for back-blading."

Ask for a demonstration

No matter what size equipment fleet you have, no matter whether you move dirt with scrapers or trucks — or both — you'll find these three major Tournatractor advantages well worth considering:

1. Tournatractor's fast pushing speed, instant gear changes and 8 mph reverse enable it to do twice as much work as a crawler-tractor on most jobs.
2. Tournatractor reduces travel time between jobs by driving anywhere under its own power at speeds up to 19 mph.
3. Its four single-wheel units, with power traveling on sealed anti-frictions, require much less maintenance than crawlers with their 450 to 550 moving parts.

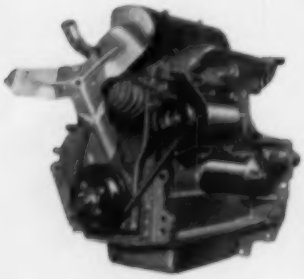
But check these advantages for yourself. Let us demonstrate a new, more powerful 208 hp Tournatractor on your job. Call or write us to arrange time and place.

Tournatractor—Trademark T-614-H-b

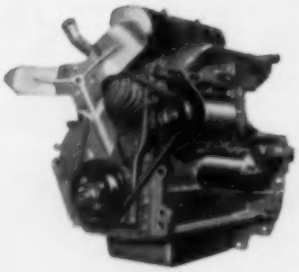
LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company



FORD "134"



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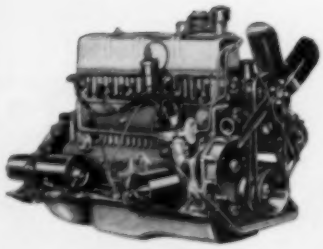


FORD "223"

NOW!

ONLY FORD OFFERS 4-6- and V-8 Overhead Valve Short Stroke Industrial Engines

FOR '56—A FORD EXCLUSIVE!
Every Industrial Engine is of Short Stroke Design!
New Ultra-modern Overhead-Valve Construction! Years Ahead in Engineering!
Engines That Give Power-Packed Performance . . . Economical to Operate . . . Last Longer

Ford
INDUSTRIAL ENGINES AND POWER UNITS

• For '56—*every* Ford Industrial Engine and Power Unit is Short Stroke! These vastly superior engines are available to you in 4- 6- or V-8 cylinders and in displacements from 134 to 332 cubic inches. *Only* Ford offers *all* engines with Short Stroke design—engines that have *large* cylinder bores and short strokes for *low* piston speeds. And, because of such short piston travel, friction is cut, wear is reduced so that *engines last longer!*

Tests prove that, in their respective displacements, Ford engines deliver *more* power on *less* fuel. If you plan to *modernize* your equipment be sure to get the most modern power available—Ford *Short Stroke* Industrial Engines.

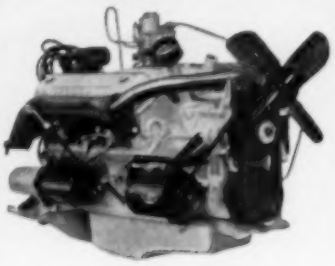
SPECIFICATIONS OF FORD INDUSTRIAL ENGINES AND POWER UNITS

SERIES	CYLINDERS	BORE & STROKE	DISPL. CU. IN.	COMP. RATIO	DYN. B.H.P.	DYN. MAX. TORQUE
134	4	3.44 x 3.60	134	6.6 to 1	48 @ 2800	110 lbs.-ft. @ 1400 rpm
172	4	3.90 x 3.60	172	6.75 to 1	61 @ 2800	148 lbs.-ft. @ 1400 rpm
223	6	3.62 x 3.60	223	7.8 to 1	107 @ 2800	202 lbs.-ft. @ 2000 rpm
272	8	3.62 x 3.30	272	7.6 to 1	131 @ 2800	249 lbs.-ft. @ 2400 rpm
332	8	3.80 x 3.66	332	7.5 to 1	160 @ 2800	308 lbs.-ft. @ 2300 rpm

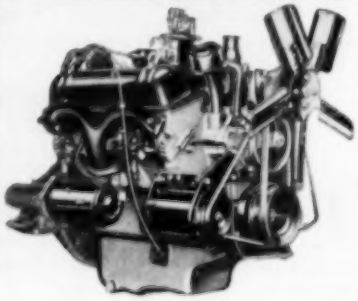
INDUSTRIAL ENGINE DEPARTMENT

FORD Division of Ford Motor Company

P. O. Box 598, Dearborn, Michigan



FORD "272"



FORD "332"

FORD Foot Mounted Power Unit

FORD Skid Mounted Power Unit

Morrison-Knudsen, Blythe Brothers, *and electric Tournapulls*

. . . the trio which is licking one of the toughest jobs in airport-building history

Excellent production with their fleet of electric Tournapulls is being reported by Morrison-Knudsen Company, Inc. of Boise, Idaho, and Blythe Brothers Company of Charlotte, North Carolina, joint-venturers on dirtmoving work for the new Air Reserve Training Center at Alvin Callender Field, Belle Chasse (New Orleans), Louisiana.

Moving Mississippi River-bed sand from stockpile to swamp fill, each of the combine's 4 high-speed "C's" completes a typical 12,000 ft. cycle every 9 minutes 25 seconds. Of this, load time averages 55 seconds; spread, 20 seconds. Load size, with 148 hp pusher aid, averages 13 pay yards . . . the 5900′ haul over well-maintained sandy roads averages 15.7 mph . . . the 5900′ return, 17.2 mph. These figures, the result of accurate time-studies made by field engineers, add up to 6 loads (78 pay yards) per Tournapull per 55-minute hour. Contractors' load count on this length haul show a similar per-machine average of 5 to 6 loads per hour for the entire construction period.

Rigs pull through soft footing

Morrison-Knudsen and Blythe Bros. officials cite "high speed" and "ability to keep traveling through soft fills" as two major advantages of their electric-control Tournapulls. The reason for Tournapulls' ability to work in soft underfoot conditions is simple. Of all scrapers, only Tournapulls have an automatic power-transfer differential *and* power steer. The differential prevents a drive wheel, which loses traction, from spinning and digging in. The power steer works through geared kingpin independent of footing, lets you pivot prime-mover from side to side to move drive wheels out of ruts.

If *you* have a tough job on hand or coming up this season, let us show you how an electric-control Tournapull can help lick it. We'll be glad to demonstrate on your job. There's a size to fit your needs . . . the 7-yard "D" . . . the 16-yd. "C" . . . and the NEW 23-YD. BIG "B".*

*Capacities heaped without sideboards. Factory-built sideboards available to increase capacity for use in light materials.

A mammoth cypress swamp of the Mississippi Delta is the scene of this sand-muck-water air-base job — one of the most difficult contracts in either Morrison-Knudsen or Blythe's long history. "Nothing can work here," many experts said. "The footing is too poor — 7 ft. of bog on top of 100 to 200 ft. of unstable material."

But Morrison-Knudsen and Blythe have rapidly proved the experts wrong. First they put a big dragline on mats, and with it stripped and sidecast all muck and vegetation. Depth of stripping varied from 1 to 7 ft. over the entire 200′ x 8,000′ runway, 2000′ runover strip, taxiway and apron areas. At another location, over a million yards of Mississippi River-bottom sand were dredged and pumped into a giant stockpile. This job, now completed, provided material for sub-base plus an 8′ surcharge. The surcharge, which will help speed settling of the sub-base, will weigh 50 to 100% *more* than the future load of pavement. It will be left on a section of sub-base 30 to 45 days, then moved forward to the next section. Six moves are planned, each move to involve handling about 75,000 yards. Photos and time study on this page were made when Tournapulls were hauling sub-base. Later, the 4 "C's" will handle and re-handle the surcharge.

Government soil experts say the sand here, dredged from river-bottom, is either marine in origin (from the ancient past when the Delta was part of the Gulf of Mexico) or glacial (washed down the Mississippi). In either case, it's probably the same hard-loading, abrasive type of sand that wrecks crawlers in your state.

Tournapull—Trademark Reg. U.S. Pat. Off. P-805-A-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

For HEAVY DUTY

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Wire Rope by MACWHYTE

MONARCH WHYTE STRAND Wire Rope is at home on today's fast, high-output equipment where heavy duty performance means savings.

There is a correct MONARCH WHYTE STRAND size and construction for every wire rope need. Give it an opportunity to serve you—you will be more than pleased with its performance.

Prompt shipment from stock can be made by Macwhyte distributors.

MACWHYTE COMPANY, 2903 Fourteenth Avenue, Kenosha, Wisconsin

Manufacturers of wire rope to meet the needs of all equipment: Internally Lubricated Wire Rope, PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cable and Assemblies, Monel Metal, Stainless Steel, and Plastic Coated Wire Rope, and Wire Rope Assemblies.

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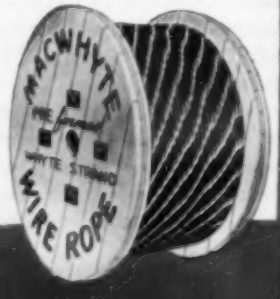
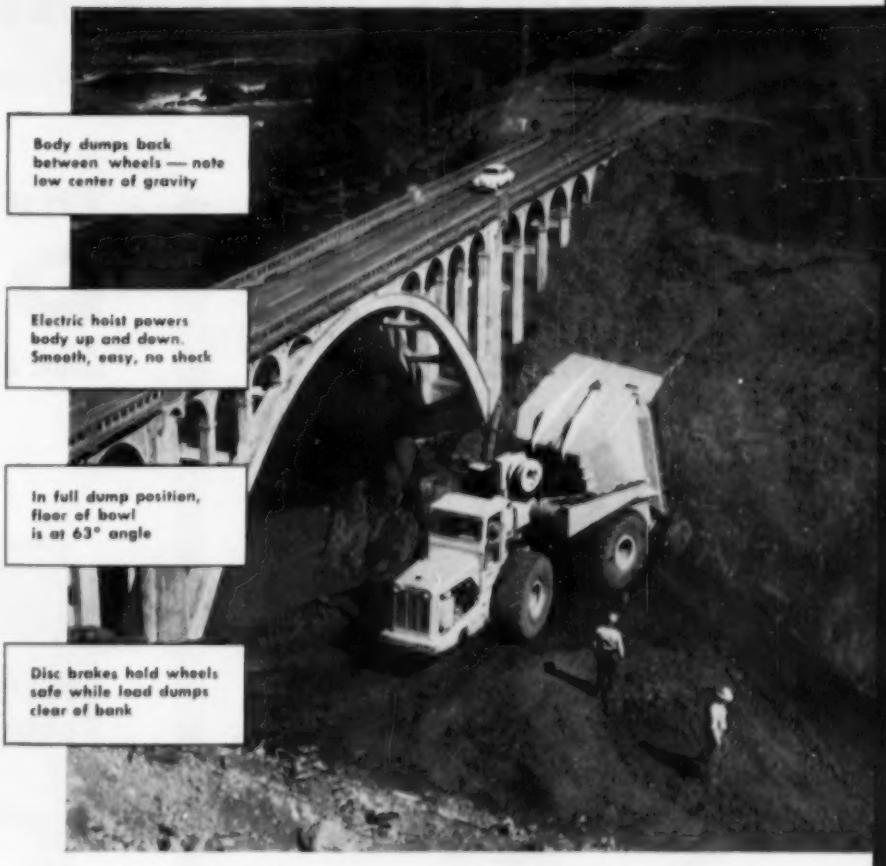


MACWHYTE WIRE ROPE

Dumps anywhere— over-the-edge or on-the-move

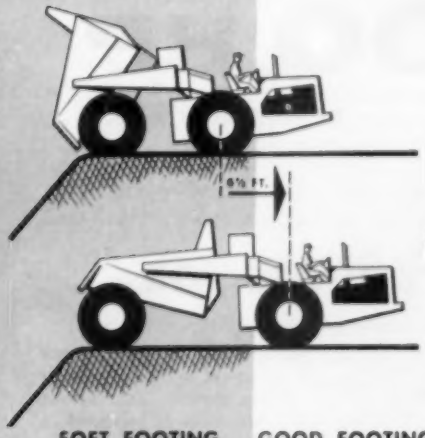
Tournapull Rear-Dumps can go anywhere—on or off-the-highway — to place loads exactly wherever you want them.

To dump over the edge of bank, all you do is back close to dump point. Rig's big single tires and power steer take you over rough footing and soft fills where many trucks can't go. Dump is made by flicking electric switch on control panel. This instantly activates hoist motor. Body "rocks" back easily over rear axle. You have power up and power down. Movement is under positive cable control at all times, can be stopped at any angle. At full dump angle, bowl lip is at ground level *behind* rear wheels. This position prevents material from rolling forward under wheels. It also provides free dump over edge of bank and greatly reduces need for dozer cleanup.


Body dumps back between wheels — note low center of gravity
Electric hoist powers body up and down. Smooth, easy, no shock
In full dump position, floor of bowl is at 63° angle
Disc brakes hold wheels safe while load dumps clear of bank

Safe at all times

In dumping, Tournapull Rear-Dumps are safer than any truck. Front-wheel-drive keeps power and traction on solid footing well ahead of rear wheels. Because body does not need to clear frame, springs, axle, or differential, its center of gravity stays low, even during dump. Oversize multi-disc air brakes — *with more braking surface on one wheel than comparable-size trucks have on all four* — prevent creeping or rolling.



Separate braking of front and rear wheels can be used with action of hoist to help front wheels pull away from edge of soft dump. In case of trouble, rear brakes are set, front brakes released. When bowl is lowered from normal dumping position, free-rolling prime-mover wheels are pushed forward. On the "C" size Rear-Dump, they move 6½ ft. — usually enough to find good footing. If front drive wheels do not reach good footing after bowl is lowered, same "leap-frog" process can be repeated. Simply pull rear wheels forward by setting front brakes and raising bowl, then set rear brakes and push front wheels ahead by lowering bowl.

Accurate spreads while moving

Tournapull Rear-Dumps can also spread on the run. Bowl can be safely raised and lowered at normal haul speed. Operator simply positions bowl for desired flow of material and continues to drive.

There's a Tournapull Rear-Dump size to fit your needs

"D"	"C"	"B"
9 TONS	22 TONS	35 TONS
138 HP	208 HP	293 HP

Prime-movers for these Rear-Dumps also power scrapers, bottom-dumps, flatbeds, and cranes.

Tournapull—Trademark Reg. U.S. Pat. Off. 8-778-G-b

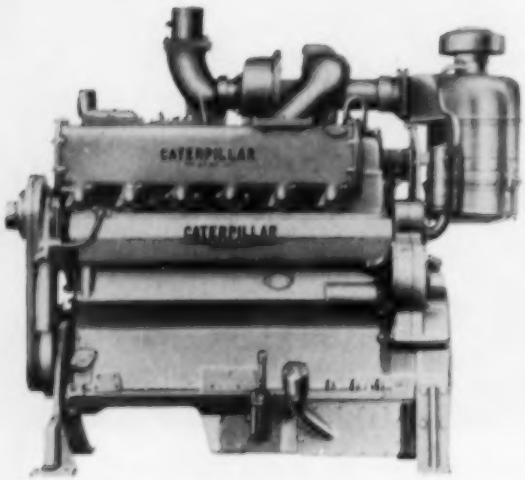
LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

Announcing 2 more new

The new D337

Series F with Turbocharger

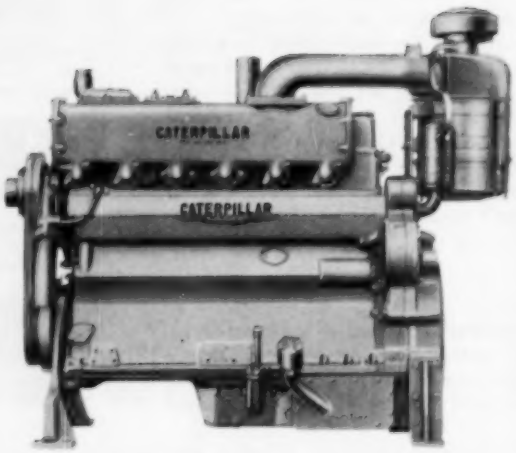


310 HP

maximum @ 2000 r.p.m.

The new D326

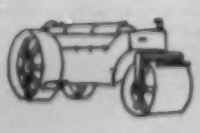
Series F



200 HP

maximum @ 2000 r.p.m.

MODERN, COMPACT, HEAVY-DUTY UNITS FOR



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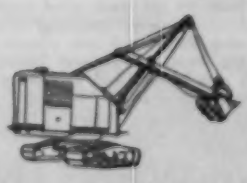

- Cranes
- Ditchers
- Dredges
- Mixing Plants
- Electric Power
- Other Construction Equipment

Available as original power in many types of equipment . . . direct drive or choice of transmissions, including hydraulic couplings and torque converters. Also available as Electric Sets and Marine Engines.

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

CAT* DIESEL ENGINES

CHOICE OF 3 STARTING SYSTEMS

AIR

For fast starts where a supply of compressed air is readily available, a sturdy vane-type air motor is offered. Also available: air compressors and storage equipment.

ELECTRIC

Where speed of starting and convenience are of greatest importance. Also available: automatic start-stop controls which require no operating personnel.

GASOLINE

For all-weather starting. This system preconditions the diesel and supplies full lubrication before the diesel is started. Also available: electric starters for the gasoline starting engine.

Here are the two newest diesels in Caterpillar's modern, heavy-duty line—more efficient, more compact and more powerful than the units they replace. In *any* application, they offer you more for your money than *any* engines in their power range!

Major advances in design and time-tested Caterpillar features combine to make this power pair more productive and economical to operate than ever. For example:

• New Turbocharger (in the D337 Series F) utilizes exhaust heat to drive supercharger. Delivers air in direct proportion to engine's need—less air at low load, more air at full load.

• New hydraulic valve lifters practically eliminate valve adjustment and provide quiet operation.

• New, improved water jets deliver fan-shaped flow, provide more effective cooling.

• Heavy-duty, oil-cooled pistons with chrome-faced rings, built for thousands of hours of work before inspection is necessary.

• Sealed cooling system reduces mineral deposits.

• Full-flow filtering of fuel and lubricating oil.

• A complete line of attachments to meet all your requirements.

All these and other features add up to a new standard of performance—better operation and more power with less maintenance and long life. For full details, see your Caterpillar Dealer. You can always count on him for reliable information and prompt service!

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

NEW D337 Series F and NEW D326 Series F— LATEST EXAMPLES OF CATERPILLAR LEADERSHIP IN ACTION

MAIL TODAY!

CATERPILLAR TRACTOR CO., Peoria, Ill., U. S. A.

I'd like more information on the new D337 Series F ☐, D326 Series F ☐.

Name _____

Address _____

City _____ Zone _____ State _____

AIR POWER *speeds trenching jobs*

faster work.....

lower costs

DIGGERS—One man operating an Ingersoll-Rand Digger loosens more material than six or eight men using ordinary hand methods. Six sizes are available, ranging in weight from 19½ to 37⅝ pounds.

SUMP PUMPS—An Ingersoll-Rand Sump Pump should be kept on hand for all trenching jobs. In cases where water problems arise the immediate application of a Sump Pump means the difference between profit and loss. Two sizes are available, the Size 250 and the Size 35.

with these **4** AIR TOOLS

UTILITY HOISTS—Ingersoll-Rand's Utility Air Hoists are used effectively for backfilling, pipe and material handling. These Hoists can be mounted in any position—pole and column mountings are also available. There are twenty sizes having single line capacities up to 3500 pounds. Capacities may be increased many times with sheave blocks.—A little air goes a long way with these popular Hoists.

BACKFILL TAMPERS—Ingersoll-Rand's Backfill Tampers are one of the contractor's greatest time saving tools because the Tamper, not the man, does the work. They provide a solid fill with no subsequent ground settlement and they are easy on the operator.

Ingersoll-Rand's latest rotary, portable Air Compressor—Four models—105, 210, 315 and 600 cfm at 100 pounds full rated air pressure.

GYRO-FLO
Ingersoll-Rand Rotary Mobil-Air

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IR CONTRACTORS' COMBINATION

18A-292

PUMPS • CONDENSERS • AIR AND ELECTRIC TOOLS • ROCK DRILLS

6″ Clearance to Replace 80 Ton Kiln Flue!

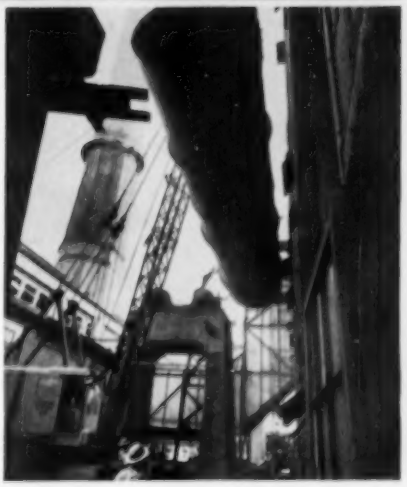
Accurate Control and Lifting Capacity Means One Machine Does Work of Two

When Maxon Construction Company, Inc. of Dayton, Ohio recently tackled a 335′ new kiln installation as part of the expansion of a large Southwestern Ohio cement plant, they discovered that work clearances were mighty tight —as little as 6″ at times! But with their Model 3900-A Manitowoc Speedcrane the extremely cramped working space proved to be a problem easily overcome.

During the kiln installation an old "downcomer" flue, weighing an estimated 80 tons, was removed by the crane with only inches of elbow room. While placing the new kiln sections, the Manitowoc was handling 37 tons on a 40′ radius and had to walk, carry, swing, twist and turn all at once. At no time did the machine or the load touch either of two buildings it was working between. Ordinarily, on a precise setting job of this type, two cranes equipped with slings are employed. Because of the restrictive space here only one unit could be used effectively in the working area. Maxon Construction Company, Inc. chose the Manitowoc 3900-A for this assignment, not only for its sure control, but also because of the machine's tremendous lifting capacity.

Outfitting the 3900-A with an extra heavy 90′ boom, the Maxon people used the precise maneuvering features of the unit to full advantage. Accurate, effective control was possible with the smooth-acting torque converter equipped with a dual governor. Power for all functions without jerking is steadily supplied by accelerator control only.

Two other outstanding features on the crane are the independent boom hoist and independent swing. The extra heavy, (Ball Bearing) worm-driven hoist gives the crane operator exceptional control when handling precise erection jobs such as the kiln section. By utilizing the independent swing, greater maneuverability is obtained through a separate set of smooth disc type clutches. Another important factor on this job was the positive crane stability



Handling up to 37 tons on a 40′ radius calls for a crane with exceptional maneuverability — that's a Manitowoc!

necessary because of the restrictive working conditions. The Manitowoc's wide, 20′4″ long crawlers provided a steady base for all of the tight operations.

The next time you face a difficult handling job, be sure to investigate *all* of the famous Manitowoc field-engineered features. See your Manitowoc distributor for the full story or write for complete literature.

Manitowoc Engineering Corp.
Manitowoc, Wis.

more performance . . .
FOR SUSTAINED HIGH OUTPUT!

more versatility . . .
FOR A WIDER RANGE OF WORK!

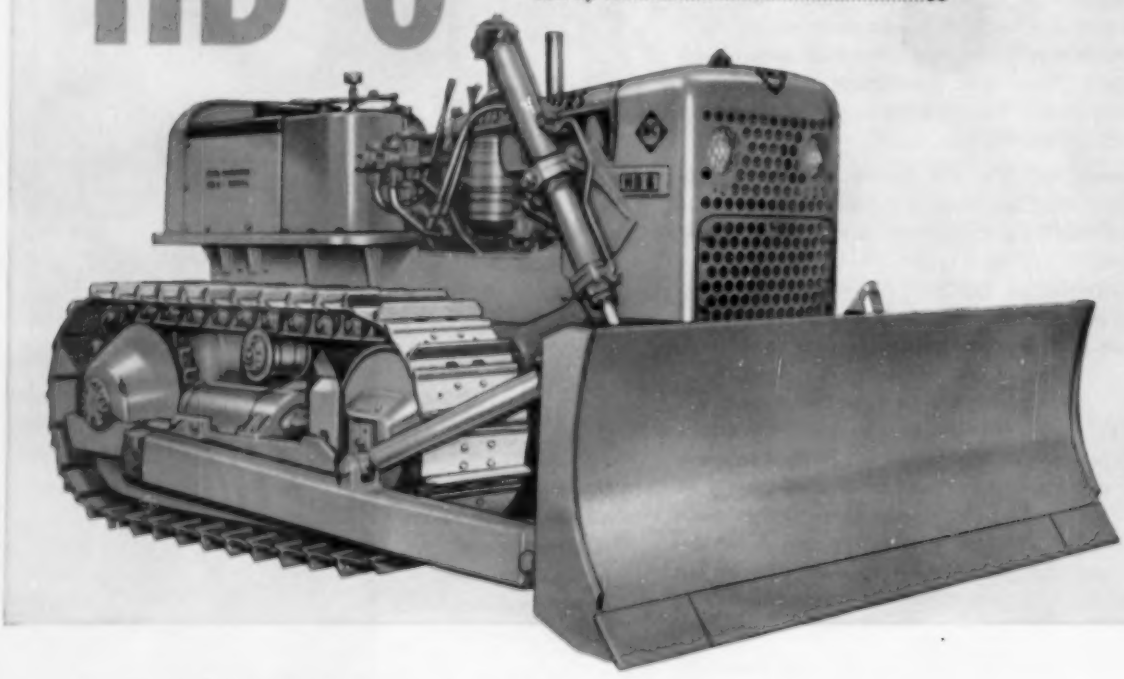
more dependability . . .
FOR LOWER JOB COSTS!

TWO NEW

HD-6

BULLDOZER-DRAWBAR TRACTOR

Weight	12,400
Drawbar hp	45
Belt hp	55



STEP UP PERFORMANCE, CUT JOB COSTS WITH EXCLUSIVE HD-6 FEATURES LIKE THESE . . .

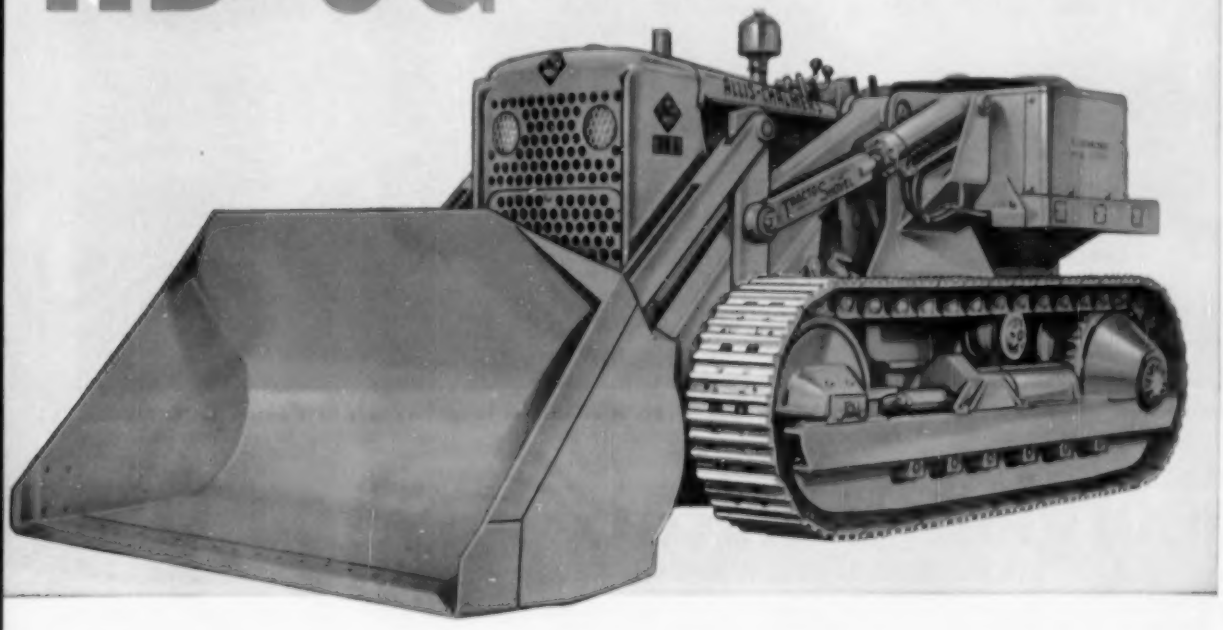
- ★ Allis-Chalmers heavy-duty diesel engine — with "follow-through" combustion for long life, low upkeep.
- ★ 24-volt direct electric starting — for convenience and efficiency (standard equipment).
- ★ Wrap-around radiator guard for maximum strength and protection . . . tilts forward for easy service.
- ★ *Ceramic* master clutch lining — lengthens clutch life, reduces lever pull.
- ★ All-steel box-A main frame — protects the entire power train, makes possible superior balance . . . plus the service simplicity of unit construction.
- ★ One-piece steering clutch and final drive housing — for maximum strength, accurate bearing and gear alignment.
- ★ Double reduction final drives (straddle-mounted on tapered roller bearings) provide maximum ground clearance.
- ★ Roller bearing truck wheels — with Positive Seals that keep dirt and moisture out . . . grease in.
- ★ 1,000-Hour lubrication intervals for truck wheels, idlers and support rollers.
- ★ Tru-Dimension tracks — with new standards of strength and hardness *throughout* for extra wearability.
- ★ Unit construction — major assemblies like engine, clutches and final drives can be removed without disturbing adjacent parts.
- ★ Engine-mounted bulldozers — for top dirt-moving performance and extra tractor life.

ALLIS-CHALMERS ANNOUNCES
HD-6 SERIES TRACTORS

HD-6G

TRACTOR SHOVEL

Weight	19,600
Drawbar hp	45
Net engine hp	57
Bucket capacity	1-1/3 cu yd



...PLUS TRACTOR SHOVEL FEATURES LIKE THESE...

- ★ Extra long track (almost 7 ft on the ground) with six truck wheels per side — for real stability throughout the digging and loading cycle.
- ★ New two-position bucket — for easy full-capacity loading in any material (standard equipment).
- ★ Heavy-duty shovel assembly — built right into the tractor, not just an attachment.
- ★ Simple, safe hydraulic system — with no exposed hoses or fittings on cowl or deck.
- ★ Two-speed reverse, high foam-rubber seat and easy bucket control — for new tractor-operator efficiency.

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ALLIS-CHALMERS

Excavating Engineer
founded 1905 NOVEMBER, 1955

A Cat D8 dozer cleans up around the scraper loading area. Depth of overburden to ore may vary from grass roots to 100 feet.

Georgian Wildcats for Iron Ore

"EIGHT years ago they said I was all through here," said John Hodge, looking across the reddened acres of his northern Georgia iron ore mine.

"They didn't get much argument from me. At that time we were just about out of known reserves of iron ore on the property. But we managed to find some more and we've been scratching along ever since.

"At no time, however, do we have more than a six month's reserve lined up.

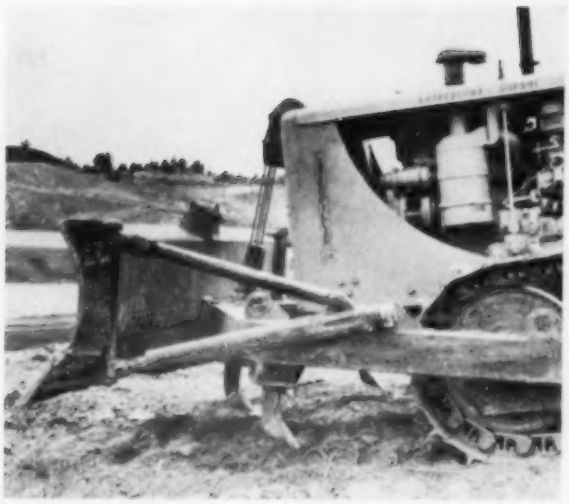
"We've managed to keep going by constantly searching the property; wildcatting for iron ore, you might call it. There is no definite pattern to this ore. It occurs in pockets, not veins. We have to drill on a hit-or-miss basis.

"We miss more often than we hit. Sometimes the ore rises 100 feet in a 30 or 40 ft. diameter chimney and you might drill down alongside it and never be aware that it's there. There was such a formation next to the highway. We drilled all around this deep but small-diameter deposit without tumbling on to it. We abandoned the area for more promising territory. Then rain water erosion over a period of several years washed the soil away from a tell-tale section of this chimney-like deposit. We brought back our drills and subsequently outlined a deposit which resulted in more than 3,000 cars of iron ore."

You need a gambler's temperament to be happy mining Georgia's brown hematite. It's elusive stuff. Yet John Hodge has been making a pretty good business of it since 1942.

The location of this gamble in iron ore is Bartow County in northern Georgia. The mine lies near Cartersville, which is 30 miles northwest of Atlanta and is a little off the beaten path as far as the world's well-known iron ore deposits are concerned. There are only two other iron ore ventures in the vicinity, one at Cedartown and another near Cartersville.

The official name of the mining firm is the Hodge Mining Co. An energetic, trim-looking individual with a crew-cut white thatch, John W. Hodge is the sole owner. You get from Hodge



This D8 is used both as a pusher and a ripper. Ripper teeth are shown (left), and ripping (right) is done on the return trip.

the impression that he is on the move, more interested in achievement than formality. He confirms this with his answer to the question about his official title:

"Call me anything you like: purchasing agent, treasurer, president—chairman of the board, if you think that sounds impressive."

Hodge's mine occupies some 1,400 acres, but so far as he knows only 100 acres cover possible iron ore deposits. The property is in a rolling hill section. It is partly covered with Georgia pine and man-made lakes. Some of the lakes were dam-produced on purpose. Others were pits, now flooded. Where either the soil or the iron ore shows through, the predominant color is red. The Georgia soil is red; the iron ore is brownish red. In fact, the name of the ore mined here is brown hematite, or Georgia brown iron ore.

Find Ore First

The first and probably the hardest step for the Hodge forces is finding the ore. A two-man crew equipped with a Bucyrus-Erie 22-T cable tool drill undertakes the prospect drilling. The crew puts down 50 to 100 feet of 8-in. hole per day. They have drilled 10,000 feet in the couple of years the mine has owned the drill. This was not accomplished by steady drilling, since the rig is used intermittently. Most of the holes have been "dry," to borrow the oilfield expression. Because the ore lies in scattered pockets and not in predictable veins, each hole is a wildcatter's gamble.

The day *Excavating Engineer* visited the mine, the crew was down 40 feet in a hole which had struck ore at 26 feet. The men were pleased. One of them expected the deposit to continue on down

Here one of four Hodge-owned Model C LeTourneau-Westinghouse scrapers hauls overburden to dump area a quarter mile away.

Two scrapers and a pusher are shown taking down the bench. Red float, a light ore appearing near the surface, is also found.

another hundred feet or so. The prediction was based on the fact that a nearby water-filled pit had yielded rich ore to that depth. But there was no money offered on the chances of that taking place here. The crew sank the hole slowly, panning frequent samples of the ore.

Before it can be recovered, the ore must be stripped. Depth of stripping varies all the way from grass roots to 100 feet of overburden.

There is both shovel dirt and tractor dirt in the mine. Where the dirt can be handled with tractor equipment, Hodge moves it with LeTourneau-Westinghouse Model C self-powered scrapers and Caterpillar D8 crawlers pulling Model 80 22-yd. Caterpillar scrapers. The mine owns six of the GM Detroit Diesel-powered rubber-tired units and four of the crawler-scraper combinations.

These rigs are applied to the overburden and to the ore moving in varying numbers, depending on current demands. During our visit, three of the LeTourneau - Westinghouse rigs were stripping a flat area 300 feet long and 100 feet wide. The company owns two D8 crawlers hung with bulldozers. These are used in road building, policing and anything else that proves handy for a bulldozer. One of the rigs was push-loading the rubber-tired units. The material here was pretty hard and dry and the crawler unit made the loading operation a little faster. In fact, the overburden was hard enough to warrant equipping the D8 with ripping teeth attached behind the bulldozer blade. Whenever the operator reversed his machine, he laid the blade on the ground and the teeth ripped the surface as he moved backward. The units on rubber sped the dirt to a dump area a quarter mile away.

Where the iron ore lies in deep de-

This 2-yd. Bucyrus-Erie 51-B dragline is shown removing iron ore pocket.

posits or where it lies in deposits near the bank of a deep pit, Hodge uses either a shovel or dragline. A Bucyrus-Erie 51-B, equipped with a Buda diesel, was newly assigned to this job. It is both shovel and dragline since Hodge bought both front ends for it.

130-ft. Deep Pocket

The 2-yd. 51-B replaced a Bucyrus-Erie 1½-yd. 38-B which had seen many years of duty in the mine. The 51-B's first job, in fact, was to finish mining out a 130-ft. deep pocket of iron ore which the 38-B had started. Rigged as a shovel, the 51-B cleaned out the hole. Then it was converted by the regular crew at the pit site to dragline front-end. Nearby the shovel front-end lay blocked-up for quick reconversion when the excavating problem called for shovel equipment.

The dragline, with a 2-yd. lightweight Yaun bucket, was positioned on top of the bank of the deep pit it had just finished. From this position it excavated a layer of red float, or granulated ore.

Red float is a layer of more or less small-particled iron ore which appears or "floats" relatively near the surface.

The 51-B is equipped with torque converter and 2-yd. lightweight Yaun dragline bucket. Here red float is loaded to one of the scraper units used to haul it to the mill.

It is distinguished from the heavy rock-like ore. In this region, you don't find the heavy ore until you pass through float and through the strata of yellow clay. The heavy ore itself rarely occurs in chunks large enough to require blasting. When it does, the rock is drilled with air drills and shot.

The red float was visible in both areas being mined at the time of our visit. It appeared in a layer six feet below the surface being stripped by the tractors. They were at work on a high bench. The front of the bench showed a cross-section with red float visible. The dragline also was excavating float which was in a deposit 10 or 15 feet below the bench on which it stood.

John Hodge is very pleased with the torque converter on his new excavator. "You're at full power all the time," he said. "It just digs into anything and keeps on digging. You can keep right on winding up on the drum. You'll pull the machine over if you've a mind to. It's really the last word."

The dragline loads the ore to three LeTourneau - Westinghouse scrapers which move it quickly over the mine's up-and-down roads to the processing plant a mile distant. Haul roads are hard and smooth, kept that way by continual attention. The second bulldozer-equipped D8 was busy re-aligning a steep haul road curve during our visit. When he finished, the curve would be less pronounced, easier for the heavily-loaded Tournapulls.

Ore Handled Twice

At the plant site, the pit-run iron ore is not fed directly to the plant. The scrapers spread it on the ground over a flat area near the hopper. Next a D8 with scraper runs over the flat stock-pile of ore and picks up a load. It feeds the ore to the plant hopper. The purpose of the double handling is to achieve better pulverization. Hodge says that it makes the material easier to handle in the plant. He estimates that they can process two or three cars more per day by dumping and picking up the material than they can if they feed directly from the haul scraper.

The ore spreading area is located on a

Prospecting drill in background is Bucyrus-Erie 22-T. Lake will be pumped dry.

high promontory overlooking the processing plant. At one side of the spread area is a ground level grizzly which guards the feed hopper. The tractor and pan combination makes a loading pass at the spread area and doubles back to the grizzly. Here the cable-controlled ejector plate in the Caterpillar scraper makes it possible to feed the plant at a uniform rate.

The first of two 80-pound monitors washes the ore through the hopper. The monitor is manually aimed and washes the material to a home-made rotary screen which is six feet in diameter and 10 ft. long. Screen bars are spaced at 4 inches so that the minus 4-in. material falls through to the washer and the plus 4-in. material rolls out the open end to the only crusher in the system. The crusher is a MacClanahan 24 x 36 single roll crusher. Although the crusher will take rocks to four feet, the largest we saw pass through were approximately two feet.

A second 80-pound pressure monitor plays into the discharge end of the rotary screen from a fixed position. All minus 4 material from rotary screen and crusher falls to a home-made two-log washer that is quite impressive. The logs are three feet in diameter, 32 feet long. A sprinkler pipe keeps extra water in the washer pan.

The screw-type log washer feeds forward to a 3 x 10 double-deck vibrating

screen. Hand-operated gates between the discharge ends of the washer logs can be manipulated to stop the feed for short periods of time. With this regulation there is little danger of overloading the screen.

The top deck of the screen is a 1-in. mesh. The lower deck is a 20 mesh. The purpose of the screen is additional washing. Jets play on the vibrating material constantly. No material is rejected for re-crushing. Very fine material falls through both screens to a settling tank. Here the ore of sand consistency is fished

Prospecting is important to the Hodge mine. Constant scouting is required by the company's 22-T churn drill to find the irregular pockets of Georgia Brown Hematite.

A LeTourneau-Westinghouse scraper highballs iron ore to the Hodge Mining Co. washing and crushing plant. Hodge owns six of these GM Detroit Diesel-powered rigs.

out by an elevating bucket conveyor and placed back on the plant's discharge belt. Before the crushed, washed ore falls to stockpile, a workman hand picks stones and roots from the belt. These are thrown to a chute which feeds a Ford dump truck. The truck is surplus as far as the mine is concerned and can stand under the chute all day until it has a load. Fortunately, there is little gravel in the mine area to complicate mining.

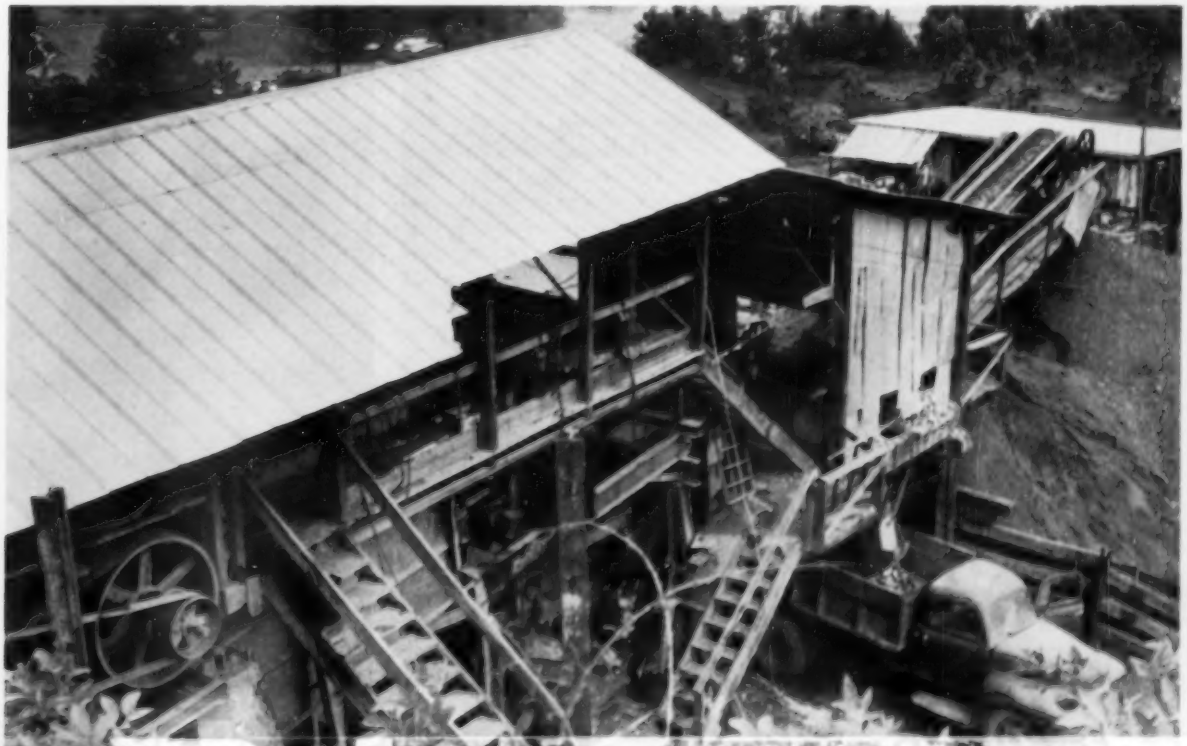
The final belt discharges the ore to a stockpile at the discharge end of the plant. The pile has a capacity of 15 railroad cars, or approximately 750 tons of iron ore.

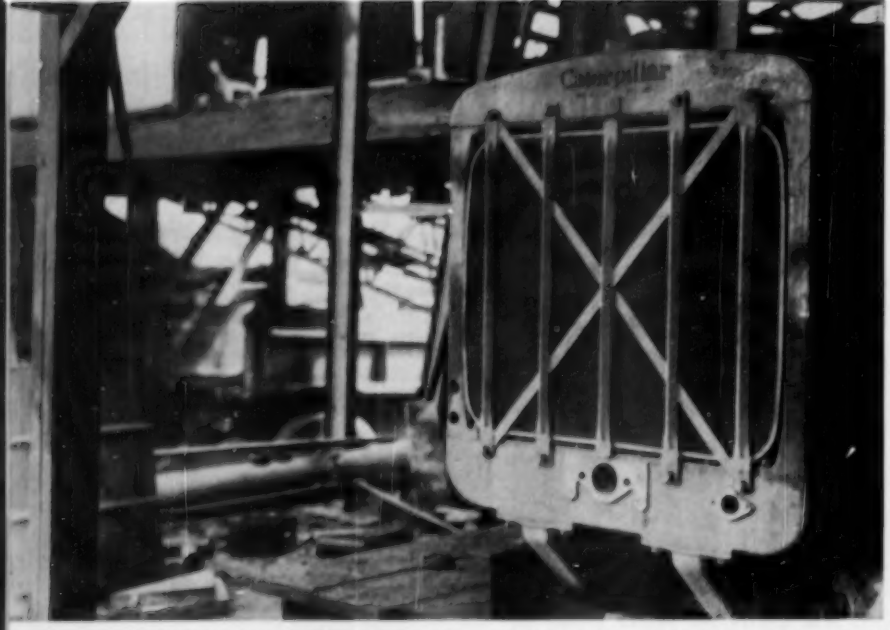
A concrete tunnel leads to the center of the stockpile. An 80-ft. long and 30-in. wide feeder belt takes ore from a discharge chute in the tunnel roof and fills haul trucks.

A four-truck fleet of Ford F-8 Big Jobs carries the ore over a 7½-mile haul route to the Seaboard Airline Railroad at Taylorsville, Ga. The Fords are

Mine-owner John Hodge attributes much success to loyal, efficient employees.

Washing plant is all-steel welded; runs on roller bearings. Raw ore enters on left. Washed, crushed ore leaves plant on right.





A lone Caterpillar D13000 diesel unit powers the entire washing and crushing plant through a system of belt drives and pulleys.

built-up 15-tonners and it requires almost four loads to top off a railroad car.

John Hodge is proud of his processing plant and the smooth way it runs. One Caterpillar D13000 diesel, transmitting power through a system of belt drives and pulleys, powers the entire plant. The fact that it seems to be running almost by itself is probably the highest compliment to its designer, Hodge. He points out that "it's an all-steel welded plant completely running in roller bearings."

Water is a two-way problem. There is the problem of keeping enough on hand to supply the processing plant and there is the problem of keeping enough out of the pits to allow mining to continue.

Manufactured Lake

The washing process requires 12,000 gallons per minute. To create a big enough pool to meet this demand, the company manufactured a 1,500-acre lake. It built an earth-fill dam between two hills. A 3-mile rain watershed drains into the area behind the dam. Drawing on the man-made lake is a Gardner-Denver 6-in. pump powered by a Caterpillar D8800 engine. This set-up moves the water through 1,600 feet of 10-in. pipeline and delivers it to the plant. When the water has been through the plant, it flows to a second lower-level discharge lake.

De-watering pits is a sister problem to the mining operation. Constant pumping is needed to allow the machines to work in dryness. In the deep pit which the 51-B had recently vacated, a Jaeger 8-in. centrifugal, self-priming pump did the de-watering job. Minus pumping, the deep pits fill to the top in a short time. There are clear green-water lakes all over the property.

After the washing at the Hodge plant, the ore is 47% iron. It then travels 160 miles by rail to the customer—the Republic Steel Mills at Birmingham and Gadsden, Ala.

John Hodge started his mine in 1942; since that time he has produced more than two million tons of iron ore. During the war, he turned out 24 carloads in a typical 12-hour stint. Nowadays the average production is near one-hundred and fifty 50-ton cars per month. The present operation is handled by 21 or 22 men working one 10½-hour shift per day, six days a week.

One of the big reasons for the small amount of manpower and for the general success of the mining company is the caliber of the employees, John Hodge maintains. He said: "I want to pay tribute to my employees and superintendent for their efficiency and loyalty. Many of them have been with me over ten years, and we have no absentee problem. They take pride in our production record and in the machinery and equipment, and I lean heavily on them to keep things running smoothly. I am sure no one ever had a better superintendent and crew. The story of the mine is to a large extent their story."

Like all successful open-pit miners, Hodge gives prime consideration to maintenance and repair. An ample-sized building near the plant houses complete overhaul and repair parts facilities.

Hodge is also a one-man cost controller for the operation. He buys gasoline and diesel fuel in transport truck lots and stores it in big elevated tanks on the property. He said that he saved 3 cents a gallon that way in Georgia. He pointed out how his men bolt shoes into the big earthmover tires. That way they deliver 10,000 miles more tire life. Hodge has learned through experience that he must watch the pennies if he expects them to become dollars of profit.

His acquaintanceship with construction equipment began in Boston many

Double handling pulverizes ore. Here a scraper dumps to the spread area.

Monitor directs 80-lb. water stream at rotary screen (left). One of four Ford F-8 trucks (right) loads for 7-mile haul to railroad.

years ago. For a period of 11 years he represented the Mead-Morrison Mfg. Co., which at that time manufactured a ½-yd. shovel. When it quit making shovels, Hodge turned to selling contractor's equipment in Birmingham, Ala. In 1942 he obtained adequate financing and started his iron mining venture. It is really not the end business goal for John Hodge, however. Some time back he founded the Cartersville Bank. Now, he has undertaken to build some houses in that town.

It is because he keeps moving forward and because he regards a problem only as a challenge and not a stopper that John Hodge will keep progressing. His attitude towards a mine problem is typical. One of his 150-ft. deep pits is completely flooded since he abandoned it some time back. Now he has found ore deep down near the pit bottom and he will have to go back in there if he wants to get it out. Contemplating the deep, water-filled pit an ordinary soul might readily pass up that particular pocket of iron ore. Not Hodge. "I've got a big pump and a big diesel back in the shop," he said. "We'll pump her out."

One of the D8 dozers keeps haul road in shape. Shovel front end for 51-B is shown in background, ready for installation on the Buda-powered unit when need arises.

One of the Bucyrus-Erie 22-B's owned by Williams Brothers Construction Co., Tulsa, Okla., works on pipeline job. Equipment was shipped from New Orleans to Alaska.

U.S.-Canadian Crews Build Alcan Pipeline

TEMPERATURES which fell to as much as 60° below zero and hours of difficult toil through rugged Alaskan and Canadian territory are vividly remembered by the men who worked on the Alaskan pipeline project.

A major construction undertaking of the United States Corps of Engineers, the $40 million pipeline project was recently completed. The project began in December 1953.

The petroleum pipeline, designed to satisfy military requirements in the Alaskan interior, covers about 626 miles between Haines and Fairbanks, Alaska. Haines is near the Alaska-British Columbia border. The pipeline crosses both British Columbia and the Yukon Territory in Canada.

The pipe is of low carbon, seamless steel, 8⅝ inches in diameter. Wall thicknesses are .277-inch and .312-inch; 42,847 feet of .312-inch type was used on stream crossings and the discharge side of a pumping station.

Normal capacity of the pipe will be approximately 12,000 barrels per 24-hour period.

Included in the project was the construction of five pumping stations: Station No. 1, on the Lutak Inlet, three miles from Haines; No. 2, 48 miles northwest of Haines, on the Haines cut-off highway in British Columbia; No. 2-A, 10 miles northwest of Haines Junction on the Alaska Highway in the Yukon; No. 2-B, on the Alaska Highway, mile post 1124, nine miles southeast of the Donjek River in the Yukon; and No. 3, seven miles west of Tok Junction, Alaska, on the Alaska Highway.

Terminal facilities of the pipeline are located at Haines and Tok Junction.

Three Contracting Firms

The project was a joint venture undertaking by one Canadian and two American firms: Williams Brothers, Tulsa, Okla.; McLaughlin Construction Co., Great Falls, Mont.; and Marwell Construction, Ltd., Vancouver, B. C. B. E. Barnes, vice president of Williams Brothers, was superintendent of the project.

About 775 men were employed at the peak of the first construction season, 1954. Of these, 280 worked on the Alaskan and Canadian pipeline spreads and the remainder was involved in the construction of the five pumping stations.

The pipeline crosses terrain generally classified as ruggedly rolling, such as is found along foothills of very rugged mountains. Starting in mountainous, heavy-timbered country north of Haines, the pipeline ascends to its maximum elevation, 3,750 feet, in the Coastal Range at Mile 55. Then follows a gradual descent to the undulating interior valley of northwestern Canada and central Alaska.

The only area of heavy timber was near Haines. Scrub fir, peculiar to the Arctic, was found in other timbered areas. On the flats between the hills, muskeg and tundra with underlying permafrost were generally found. Permafrost occasionally was found on the tops of the hills.

The range of soil types encountered

Rugged conditions—snow, ice, muskeg, frigid weather and wilderness—slowed but never stopped progress on the Corps of Engineers' $40 million Haines to Fairbanks (Alaska) pipeline.

Equipment was assembled at Tanacross Camp (above) for spotting along pipeline site. The SS *Nordnes* (below) unloads English pipe for Canadian portion of the line.

included isolated solid rock, gravel and sand with little or no frost content and muskeg and tundra, underlain by permafrost.

Often, the permafrost began immediately under the grass roots and continued to undetermined depths. When the cover or insulating blanket of vegetation was disturbed, the underlying permanently frozen soil began to thaw, making a quagmire of the right-of-way.

Winters Are Severe

Despite the biting temperatures, clearing along the right-of-way began in December 1953 and continued through the winter. With the exception of some tie-ins, the job of welding together the pipeline was completed within six months in 1954, from April 19 through Oct. 15. Work on the pumping stations in 1954 lasted from April until mid-December. Some interior work on the stations was resumed last February.

The Alaskan pipeline spread worked six days a week and laid an average of 70,330 feet of pipe a week, or 1,675 joints. Working seven days a week, the Canadian spread averaged 75,768 feet, or 1,804 joints. The record for the most pipe laid in a 12-hour period was set by the Alaskan spread—542 joints, or 4.31 miles. Best mark of the Canadian spread was 420 joints, or 3.3 miles.

With the Arctic construction season limited principally to the period between May 1 and November 1, give or take some days in either direction, construction crews had to make headway while they could. At the height of the season, the ditching operation was conducted 24 hours a day.

Approximately 122 miles of the pipeline were buried because of the perma-

(Below) Two Cat D6 tractors equipped with pipe layer sidebooms prepare pipe for welding crews. The 626-mile line follows general route of famous Alcan Highway.

The scenery is beautiful but the country rugged as this 22-B dragshovel trenches a watery section of the 3,304,089-ft. line.

frost. The remaining 500 miles were exposed; the pipe was laid slack to allow for expansion and contraction.

Ditching for required pipeline burial, road crossings and stream crossings was done by a modified Cleveland 300 ditching machine and Bucyrus-Erie 22-B dragshovels and clamshells. When permafrost was encountered, no standard thaw program was used. Blasting was needed for ditching through solid rock and, occasionally, for permafrost.

A reinforced 12-ft. diameter wheel was substituted for the standard 18-ft. wheel on the Cleveland ditcher. The special wheel had 14 buckets, providing the machine with a continuous digging cycle and eliminating jarring action.

The ditcher excavated through icy and non-icy soils, with the dragshovel-clamshell team following behind to clean up the ditch. Where boulders and rocky-type soil were encountered, the dragshovels and clamshells did the ditching.

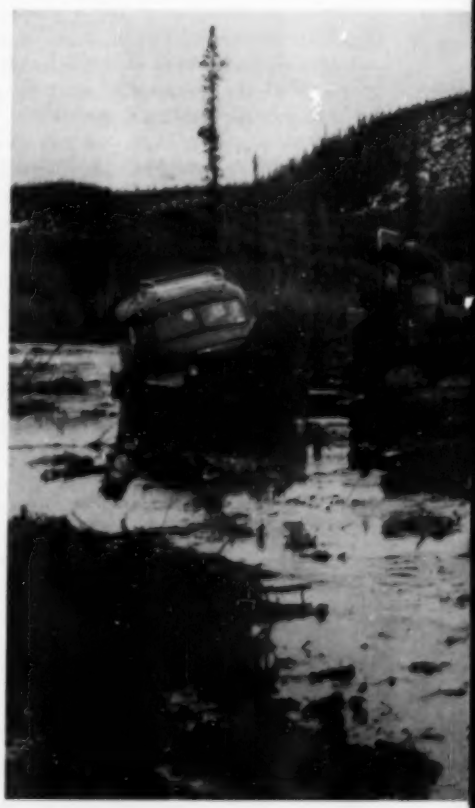
In bidding the project, contractors gave estimates on the cost of making a seven-mile crossing of Kluane lake or of carrying the pipe around the lake. Though the latter method meant adding eight miles to the length of the pipeline, it was chosen because it was deemed more economical. Kluane Lake is 290 feet deep; the crossing method, had it been selected, would have been the deepest ever attempted in pipeline history.

Two unusual right-of-way clearing methods were attempted, and later abandoned, at Haines. In one, two Caterpillar D6's pulled a steel clearing ball, six feet in diameter. This was effective only in small brush and was completely ineffective in heavy timber.

Also used was a "spur tree" for collecting heavy stumps and logs into burn-off piles. The stumps and logs were dragged by a Caterpillar-powered dragline which was attached to the top of the spur tree by pulleys. The method proved ineffective in heavy timber.

Weather caused some delays. Portions of the right-of-way and highways and bridges were washed out in the Kluane Lake region by flash floods, caused by heavy rains and melting glaciers. Extensive burial of pipe for protection was required in many rock wash areas.

Melting permafrost caused frequent swampy areas, necessitating detours and the use of concrete weights to prevent the pipe from floating. Equipment often



A tractor does lifeguard duty as it rescues a nearly submerged truck in Yukon.

bogged down and even "dropped out of sight" in flooded muskeg areas. Draglines did the retrieving.

Wildlife was plentiful but caused no substantial problem, although the presence of bear caused several cases of fright. The story, supposedly true, is told of three inspectors walking along the right-of-way in the Canadian section. A bear approached them from the left. The inspector on that side detected the animal and ran for a tree without giving warning to his unsuspecting companions, who continued walking. The second man then detected the bear and, without words, took refuge in a second tree. A bit later, the third man turned to the left to speak to his companions. He quickly occupied the third tree. The report said that the inspectors remained treed until an approaching Cat sideboom scared off the bear.

The terminal operation at Haines includes: a 200-ft. long petroleum wharf, a T-type structure of steel H-pile with concrete deck; nine 30,000-barrel, two 5,000-barrel and one 1,000-barrel welded steel storage tanks; and universal manifolding and transfer pump facilities to permit inter-transfer between tankage.

The Tok Junction terminal includes

Continued on page 38

Bending crew (above) uses Cat D6 with sideboom and bending attachment. (Below) A Williams Brothers owned 22-B digs deep on special assignment in rugged country.

A PICTURE REPORT OF

INTERNATIONAL POWER *in action!*

Boosting job production everywhere

13 TD-24's for Nello Teer—Most of the tractor work on their 4.98-mile, 3,065,000-yd. $4,306,000 section of the Massachusetts Turnpike is being done by these 161 dhp crawlers. Four with scrapers combine to average 327 twenty-yard loads daily on 1500 ft one-way hauls. Others tow rippers, push-load scrapers, or clean up around Teer's two 2½ and 4-yd shovels and 10 haulers.

"1/3 more overburden daily than competitive crawlers" . . . that's the report from Merkli Brothers Coal Company, Beaver, West Virginia, on their International TD-24. Unit is stripping 40 feet of sandstone and shale to uncover a 12 to 51-inch coal seam. "It has better balance and visibility than other tractors," says Partner Henry L. Merkli. "It costs less to maintain; takes less time to grease, too."

Crushes gypsum—Near Avenal, Calif., Superior Gypsum Company's International-powered crusher produces 300 tons of gypsum per 8-hr. day. Material is used to neutralize high-alkali irrigation water.

1 more trip hourly—Fast loading and acceleration help 18½-yd. Payscraper make one more trip hourly than other self-propelled scrapers used by W. E. O'Neill Construction Company, Gary, on their 2½-mile, 700,000-yard Indiana Turnpike section near Gary. Cycle length averages 2½ miles; material is mostly sand.

80 ft ditch in 3 hours—Excavating for water main in Henderson, Texas, International "300" wheel tractor dug 100 cu yds of clay hourly. Backfilling was handled by rig's front-end loader. Ditch is 4 ft deep, 22 in. wide.

"We saved 100 man-hours by lifting zonolite roofing slabs with our International-Drott TD-6," reports M. G. Aldrich, Macon, Georgia, on the 13,000 sq ft building job shown. Lifts of 1 ton were made to 10 ft eave height.

Rugged in rugged rock—"TD-6 is ideal for opening underground mines," says Malcolm McDonald of Kiabob Uranium Corp, Green River, Utah, "It gets around fast in narrow tunnels, yet brings out big loads."

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PAYSCRAPERS	WHEEL TRACTORS	CRAWLER TRACTORS	DIESEL, GAS ENGINES
12 yds. and 18½ yds.	6 Models . . . 9 to 59 dbp	8 Models . . . 45 to 200 hp	10 Models, 16½ to 208 hp

ALSO: International Drott Skid-Shovels . . . International Scrapers, Bottom-Dump Wagons . . . and International Superior Pipe-Boom Tractors.

Welding crew (above) uses two Lincoln Electric welding units mounted on a Cat D6. Pressure testing (below) was done with a Gardner-Denver pump, on a Ford F-600.

Pipeline . . .

Continued from page 35

nine 30,000-barrel, three 5,000-barrel and one 1,000-barrel welded steel cone-roof storage tanks and universal manifolding and transfer pump facilities.

The facility of pumping station No. 1 includes 12 buildings. Mainline pumping equipment includes three Wilson Snyder Model 558-P Quintiplex Power Pumps in parallel, each pump rated at 272 gpm maximum at 110 rpm with 4½-in. plungers and 1,200 psi maximum discharge.

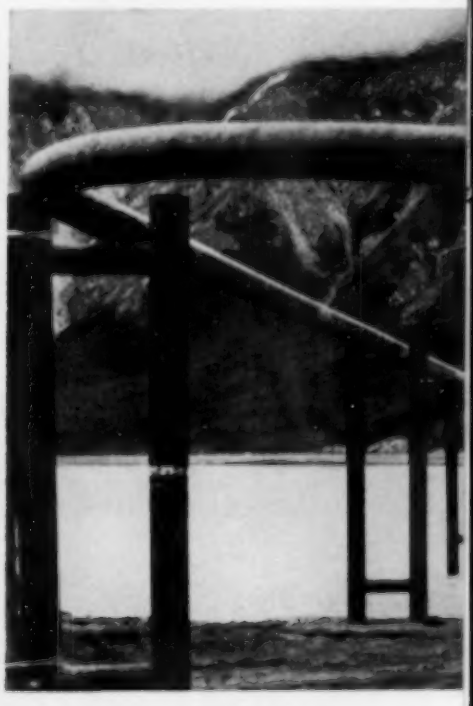
The engines are driven by Chicago Pneumatic Model 69-CP six-cylinder diesels rated at 285-hp at 720 rpm.

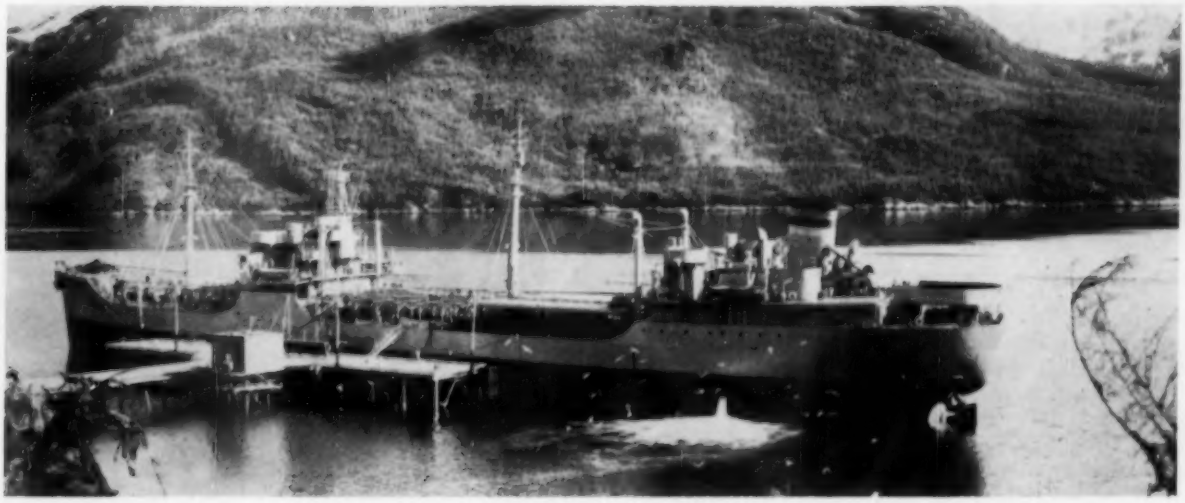
Nine buildings make up the facility of pumping station No. 2. Mainline pumping equipment includes three Byron Jackson 4 x 6 four-stage type OLMX centrifugal pumps in series driven by Chicago Pneumatic Model 69-CP diesel engines. Maximum station discharge pressure is 1,450 psi.

Station 2-A has four buildings. Two Byron Jackson 4 x 6 four-stage OLMX centrifugal pumps in series are driven by Chicago Pneumatic Model 89-CP eight-cylinder diesel engines rated at 450 hp at 840 rpm.

Five buildings are at Station No. 2-B. Its pumping equipment is the same as station 2-A's.

Station No. 3 has 11 buildings. Its mainline pumping equipment includes





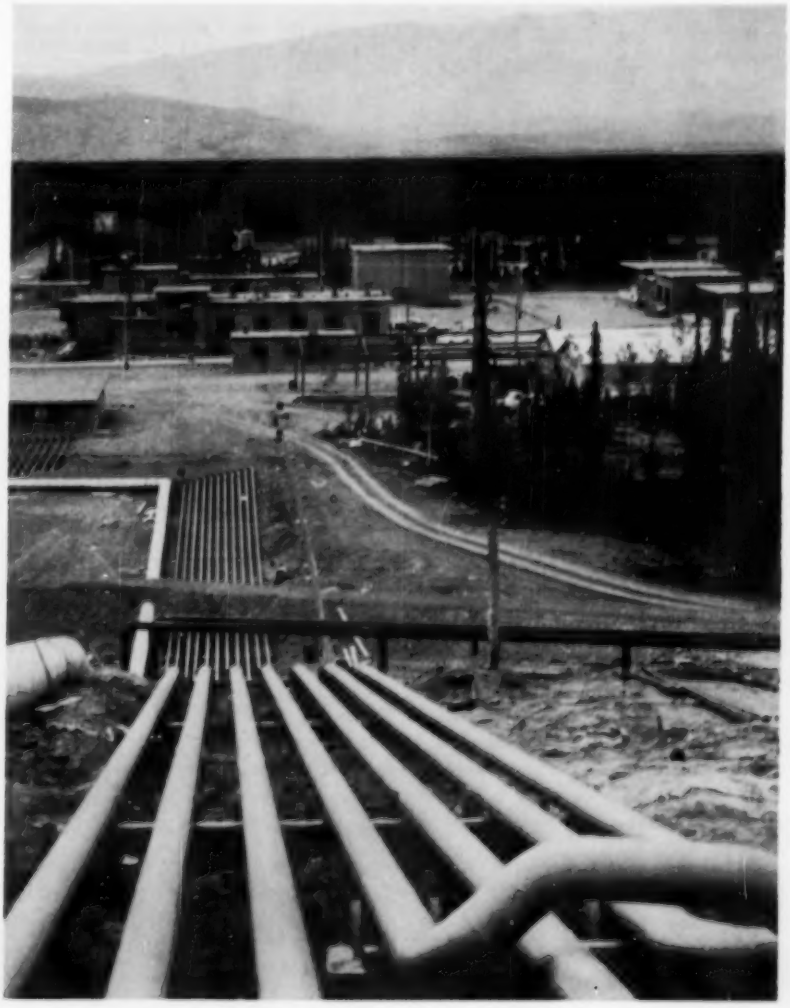
three Wilson Snyder Quintiplex pumps with the same specifications as Station No. 1 and two Wilson Snyder Model 36-P Triplex power pumps rated at 44.7 gpm maximum at 90 rpm with 3-in. plungers and 1,200 psi maximum discharge pressure. The pump drivers are Caterpillar D-8800 diesels.

Take-off facilities, to meter and direct fuel to storage and fuel handling equipment, are at Big Delta, Eielson and Ladd.

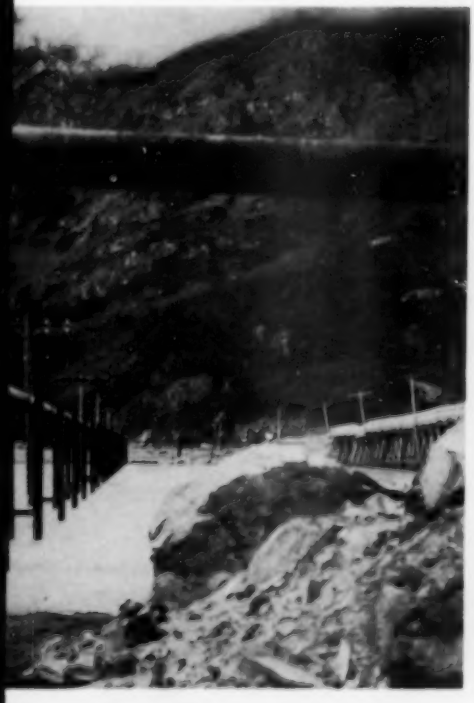
Dormitory type bunkhouses were pro-

Continued on page 49

The U. S. Navy *Millicom* (above) delivers first load of diesel fuel to pipeline at terminal dock near Haines, Alaska. Pumping station (below) is seen from tank farm hill.

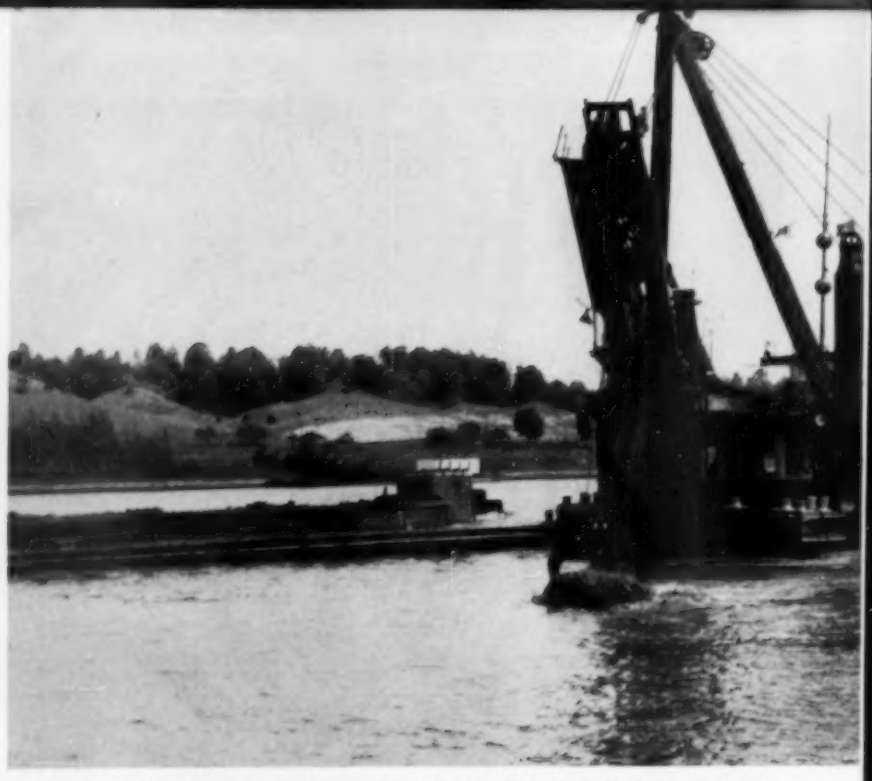


Pipeline crosses tributary of Kluane Lake in Canada. H-frames were driven 55-ft.



Workhorse of the Lakes

by Ray Day



Clearing the water surface is the dipper of the dredge, *Colonel D. D. Gaillard*, as the 40-year-old veteran of the Lakes handles a dredging operation in Portage Canal.

ON a midsummer day of 1955, near the upper entry of Portage Canal on Lake Superior near Hancock, Mich., the dipper dredge *Colonel D. D. Gaillard* sat on its massive spuds digging. With monotonous regularity, operator P. J. Coppo and craneman Arnold Lawin boomed over and put the *Gaillard's* dipper stick deep into the hardpan under the Portage Lake Harbor of Refuge. They came back over the 590-cu. yd. dump scow with another 4½ yards of shoal material, a menace to the ship channel. A typical example was being set of efficient dipper excavation in the middle of the 20th century.

The *Gaillard* was doing the same job under President Woodrow Wilson 40 years ago, before the first World War!

The steel hull which has supported the *Gaillard* all these years was launched at the old Hartmann-Creiling Co. shipyard in Green Bay, Wis., in 1915. Steam-shovel excavation had been proved capable. The United States Army Corps of Engineers began to plan. These men, responsible for the maintenance of all navigable U. S. waters, needed a machine capable of digging everything from mud to rock and hardpan in the shoals which menaced ore boats on the lakes. If such a dredge could be built, one machine might maintain many harbors and channels. The idea was so revolutionary then that it was considered fantastic.

Special Machinery Designed

Established companies co-operated. The full shipyard facilities of Hartmann-Creiling were made available. One of the most difficult problems was to design dependable, powerful machinery capable of maintaining high production records when the dredge began to work. The Corps of Engineers consulted the Bucyrus Co. of South Milwaukee, Wis., then a veteran of 35 years in the manufacture of excavating equipment.

Bucyrus engineers designed machinery for the *Gaillard:* winding gear, main hoist, spud and anchor hoists and auxiliary equipment. The main hoist was increased in size many years later and the original steam boiler was exchanged for the newer boiler out of the hopper dredge *Burton* when it was junked. But the original machinery is there in most cases, functioning well.

Then, as now, men wrestled with the typical problems of shovel excavation. Bail pull in relation to the front end, changing geometrics as a dipper is pulled from the toe of a bank up toward its top and the relation between hoist and crowd as the dipper moves through the cut —these were some of the things considered. Even today the *Gaillard* is considered one of the best dipper dredges in the world.

The dredge was named after Lt. Col. David DuBose Gaillard. Gaillard's name is linked with excavation. The Gaillard Cut on the Panama Canal is named after him, commemorating his supervision of dredging the Panama Canal prism, breakwater and harbor preparation in the Canal Zone when it was built.

Born in South Carolina in 1859, Gaillard was graduated from the U. S. Military Academy in 1884. From March 9, 1901 through June 6, 1903 he was dis-

A load of muck from Portage Canal's channel is dropped into the dump scow.

Forty years ago the dredge Gaillard was launched at Green Bay, Wis. Today this forerunner of modern excavating equipment still works efficiently — and its end is not in sight.

Emerging from the water with a dipper load of material is the ponderous dipper stick of the *Gaillard*. The *Gaillard* was launched in Green Bay, Wis., 40 years ago.

trict engineer at Duluth, Minn., for the Corps. It was during this time that Col. Gaillard wrote *Wave Action In Relation To Engineering Structures*, which is still considered one of the most authoritative books in the field of hydraulics.

Gaillard presided over the Duluth District when many of its early works were started. The development of a major harbor at Duluth, along with other harbors and ship channels and the Portage refuge canal through Michigan's Upper Peninsula, were included among the district's early tasks. Col. Gaillard died in Baltimore, Md., December 5, 1913.

Husky Rig

The *Gaillard* still gives its visitors an impression of mass, weight, and power. Despite its age, few things seem out of proportion, except an abnormally heavy boom. Its swing circle mounting is on the second deck level. Actually, the long boom and dipper stick always had certain digging advantages which permitted the dredge to work cuts up to 50 ft. wide. Its 58-ft. dipper stick also will let the dredge dig 27 feet below water surface on wide cuts.

The *Gaillard's* steel hull still is in excellent condition. It is 116 ft. long, 40 ft. wide and is tapered for depth from 11 feet on the forward end to nine feet aft. Its steel spuds are 36 in. square, of hollow steel construction 64 ft. long

Close-up shot shows the dipper dropping a load of material into the dump scow. The dredge was named after Lt. Col. David D. Gaillard, a name linked with excavation.

The tug *Houghton* tows an empty dump scow down the canal, on Lake Superior.

and are handled by 2-in. diameter spud cables from Bucyrus-designed spud engines.

The dredge has several dippers for various kinds of digging. One of the most popular is a 4½-yd. unit with a built-up lip extension which increases its capacity to about 5½ yards. This bucket is used in mud, sand, light gravel and silt. Smaller size buckets are used in cemented hardpan and harder materials such as sandstone.

Two-Man Operation

Original boiler equipment was a coal-fired unit. The latter was replaced by an oil-fired boiler from the *Burton*. This unit delivers steam at 150 psi to the various engines, including hoist, backup, spud and dump engines. The latter is boom mounted. The *Gaillard* also has a craneman's platform where one man, assisting the dredge operator, controls the crowd function of the dipper stick and dumps the bucket at the proper time. The addition of an Engberg diesel generating set for auxiliary use also was a concession to modern times.

The lever controls in the pilot house are still easy to handle, according to the operators. Although the controls are a far cry from today's push-button operation, the casual visitor senses a kind of respect in the way operators handle the levers and brakes.

The main hoist cable is a 1¼-in. diameter improved plow steel line in a two-part mounting. It delivers about 350 tons of bail pull when the going gets tough. When all of that bail pull is on, things give down below. So well were the front end geometrics worked out that the *Gaillard* seems to do phenomenal things. The dredge has successfully raised pieces of rock estimated to contain 12 cubic yards after hanging them

In 40 years the *Gaillard* has had only four skippers. Shown is the present skipper, Capt. George Swanson. The equipment on the dredge has required very little repair.

just right in the bail of her dipper. She also has dug hardpan and sandstone formations.

It Dug The Tough Ones

The *Gaillard* has for forty years been strictly a Great Lakes machine, although occasionally it has left the Lake Superior area covered by the Duluth District (now the Duluth area of the St. Paul District). In addition to its work along Lake Superior, it did work at Sandusky, Ohio, Detroit, Mich., in the locks at Sault Ste. Marie, Mich., and many other places.

One of its toughest assignments came during World War II, in 1943, when Bayfield Channel of St. Mary's River near the Soo Locks needed dredging. The area was big, the formation was bad and the location was in the heaviest traveled water highway in the world, where ore traffic funnels down to enter or leave the locks. The maps of that job still are stowed aboard the dredge. The area covered by the rig was big enough to have been dug by a fleet of cutterhead-type machines. At that time, however, the U. S. Navy had gathered practically every hydraulic dredge in the country for service in Guam, the Philippines and other spots in the Pacific. There was probably no more important digging job in the world, the Pacific included, than the vital navigation job at Bayfield Channel. And the old veteran of many a Lake Superior battle did it.

The *Gaillard* has done its share of dangerous work. Two years ago, a dangerous shoal was found protruding from Gros Cap Reef, three miles off point Iroquois in the open water of Lake Superior west of Sault Ste. Marie. Here again the formation was hard and spud footing not too good. The nearest shelter of Waiska Bay was seven miles away. Lake Superior dredgemen know well how rapidly storms can blow up on the open lake, so when the *Gaillard* drew the assignment, the crew expected anything.

Squall Lashes Dredge

One day during the early phases of the job, a sudden squall lashed Lake Superior to white-capped fury. Within an hour everything, the dredge included, was in mortal danger. Up came its spuds. Anchors were hoisted. The dredge started for shelter behind the tug *Marquette*. Midway to shore, two dump scows broke loose from the tow and, driven by the high wind, began drifting downwind at a speed of about 10 mph.

Excellent seamanship and courage on the part of Capt. Albert Sorensen of the tug was all that saved part of the tow from disaster. Sorenson kept on course until he had the dredge safely in Waiska Bay. Then he turned his tug out into the full fury of the storm again. He found and picked up his drifting scows amid mountainous waves. Thanks to this feat, the *Gaillard* was able to resume digging when the weather calmed.

Through the years, the *Gaillard* has

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Operator P. J. Coppo (left) handles the lever-controls on the bridge. Arnold Lawin (right) controls crowd and dump action.

News from the Field

Offer Degree in Construction

The Civil Engineering Department at Stanford University, Palo Alto, Calif., is now offering a one-year graduate program directed specifically at construction. Its aim is to give students a fundamental background in subjects important to the industry.

The course, which has been established with the advice and counsel of leaders in the construction industry, is among the first leading to a master's degree in civil engineering. It is an extension of the undergraduate construction program that was established as an option in civil engineering in 1946.

The graduate program will be broad and in addition to civil engineering will offer a choice of classes in the Stanford School of Business, and in industrial engineering, law, geology, mining, and parallel fields. A new series of graduate courses in construction, made possible by additions to the staff, will be offered. The graduate work is planned to broaden each student's training into non-technical areas not covered in undergraduate study, as well as provide a systematic course of instruction leading to management responsibility.

Leading contractors and the California chapters of the Associated General Contractors have helped select the courses and prepare the graduate program, as they have formerly participated in the undergraduate training of Stanford engineers for careers in the construction field. The contracting industry will also provide a series of speakers to address the graduate classes on specialized subjects.

Air Command Goes Underground

A new $8½ million headquarters building is under construction for Strategic Air Command at Offutt Air Force Base near Omaha, Nebr.

Of atom bomb resistant design, the building, which will become the control point for global operation for all SAC aircraft, is being built completely underground. Covering an area of nearly 20,000 square feet the completed structure will burrow three stories under the earth to a point where its base slab will lie ten feet below the level of surrounding water.

Heavy, wet marl is being push-loaded by this International TD-24 and Model C Tournapull. New underground headquarters of SAC will go down three stories.

The project is under direction of a general contractor, Robert E. McKee Co. of Glendale, Calif. Excavating was being done by the Miller Excavating Co. of Omaha. Two LeTourneau-Westinghouse C Tournapulls with P-19 scrapers were used for the bulk of the work. The remainder was to be handled by a Lorain dragline loading into a Caterpillar D-8 and 80 scraper combination.

According to Jim Jorgensen, superintendent for the Miller Co., water has been the big problem throughout the job. During the initial excavation stages it came in the form of heavy recurring rains which caused delays. Later, after weather had cleared, the excavation penetrated to a point where sub-surface water in the pit had to be drained by sinking a series of pipes to the water table.

Working conditions have become progressively more difficult as the depth of the excavation has increased. When about three-fourths of the job was completed, the material taken out was heavy wet marl. The final 14 feet of cut was averaging 33% moisture.

Removing the material involves a cycle of nearly 1,000 feet characterized by a steep haul up an 8 to 10% adverse ramp grade to the rim of the hole.

Operating conditions and poor weather hindered the operation in its earlier stages. Latest reports indicate, however, that the project has been able to maintain its schedule.

AGC Board Holds Midyear Meet

Both immediate and long-range prospects are for a continued volume of construction at record levels, H. E. Foreman of Washington, D. C., managing director of The Associated General Contractors of America, said in his report to the governing and advisory boards of the AGC at the Radisson Hotel in Minneapolis, Minn.

Many studies indicate bright long-range prospects for the construction industry, he said. As an example, he cited a recent joint survey by the Departments of Commerce and Labor which placed state and local public works needs at $200 billion during the next 10 years.

Building, highway and heavy engineering activities are all showing increases, Mr. Foreman reported. Highway construction is expected to exceed last year's volume by 20%, industrial construction is up 8%, public utilities 4% and military facilities and sewer and water works 12%.

The AGC officials said construction

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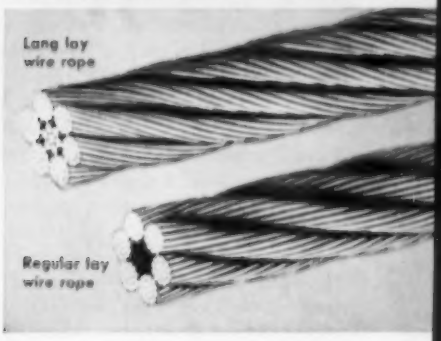

What extra good will Leschen Lang lay wire rope do for you?

Look at a length of Lang lay wire rope. Compare it with regular lay. Notice that the *wires* in Lang lay rope twist in the *same* direction as the *strands*. In regular lay rope these directions are opposite.

What does that do? It makes the exposed length of the outer wires in Lang lay rope about twice as long as in regular lay rope. It has extra bearing surface to withstand wear from scuffing, rubbing and other abrasive action. Also, because Lang lay wires and strands are laid in the same direction, the rope has greater flexibility.

What's the result? Simply this—on some types of duty, where abrasion and bending stresses are abnormal, Leschen Lang lay rope definitely lasts longer than regular lay. Replacements are fewer. Costs are lower. And, with Leschen you are assured of *higher-than-rated quality* for *longer-than-expected wire rope service*.

Can you use these benefits? To make sure, ask your Leschen man. Leschen makes all types of Red-Strand wire rope for all types of jobs, and can help select the best one for you. Perhaps you *should* use Lang lay. Talk to him soon.

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LESCHEN WIRE ROPE DIVISION
H. K. PORTER COMPANY, INC.
St. Louis 12, Missouri

News . . .

Continued from page 44

materials generally are in adequate supply.

The three-day AGC midyear board meeting had some 400 construction leaders from all parts of the country in attendance. They represent more than 6,400 member firms of the AGC. Besides officers, board members and national staff members, officials of 124 AGC chapters and branches in the United States and Alaska attended the meeting.

Seaway Project Progresses

The billion dollar St. Lawrence Seaway and Power Project now underway along the 114 mile route of the river from Montreal, Que., to Ogdensburg, N. Y. is moving steadily ahead. The majority of activity centers around Massena, N. Y. The major portion of the power project is being constructed in the International Rapids section, a shallow, fast-running portion of the St. Lawrence. By the 1959 navigation season, plans call for the completion of the Long Sault Dam; the Barnhart Island powerhouse; the Iroquois dam; and a system of canals, containing six locks, allowing water traffic to be channelled past the hydro-electric installations.

The make-up of material in the area is especially demanding of machines. Glacial till is predominant, containing boulders of all sizes. Besides the glacial till, some areas have thick layers of sticky, slippery clay, which bogs down wheel-type equipment. To handle this material, draglines and shovels for loading trucks and wagons are predominantly used.

The Badgett Mine Stripping Corp. is using a Bucyrus-Erie 450-W dragline to facilitate work on a $1,372,800 contract calling for excavation of a section of the Long Sault Canal. According to its owner, the dragline, nicknamed the "Gentleman," is currently handling 12,000 yards of boulder-strewn glacial till and blue clay daily.

A short distance away, engaged in excavation of the Grasse River Lock and construction of two miles of dike, the Dutcher Construction Co. is working on a contract calling for the excavation of approximately 3,100,000 cubic yards of glacial till and blue clay.

The balky quality of these different materials requires the use of two different earthmoving methods. On top of the lock excavation is about 800,000 yards of brown, sandy clay, containing small boulders. Beneath this is 30 to 40-feet of blue and gray clay. Under the blue clay, on top of the bedrock, is a 20 to 40-ft. layer of compacted glacial till.

Dutcher is using nine Cat DW21 scrapers with two Cat D9's and a D8 as pushers to move as much of the topsoil as possible, leaving three to four feet of the harder brown till to serve as a strong base for later operation of draglines, and for semi-permanent haul roads. After the removal of topsoil, two 4-yd. draglines load nine Cat DW21-powered 31 ton capacity C&D Movalls.

When completed, the Seaway, now ending its first year of growth, will provide a 2,400 mile system of inland waterways, enabling ocean-going vessels to unload their cargoes on the docks of Duluth, Chicago and other Great Lakes cities.

The mammoth Seaway project, sponsored jointly by the federal governments of Canada and the United States, is slated for completion in time for the 1959 navigation season. Meanwhile, it is providing the medium through which men and machines are writing another chapter in modern construction history.

Cat D8 builds a breakwater to divert St. Lawrence River water away from bridge footings. Bridge will be to Barnhart Island where a powerhouse will be built.

Robert Perry Tyler

Robert Perry Tyler, vice president in charge of sales of Macwhyte Co., Kenosha, Wis., died at his home October 2, 1955, in Kenosha.

He was born at Roanoke, Va., October 7, 1897, and was widely known throughout the wire rope industry.

Mr. Tyler joined Macwhyte Co. in 1945 as general sales manager, was elected a director in 1946, and appointed vice president in charge of sales in 1947.

Prior to his association with Macwhyte Co., he was employed by John A. Roebling's Sons Co., Trenton, N. J., and A. Leschen & Sons Rope Co., St. Louis, Mo., as general sales manager.

Ohio Turnpike Opens

The remaining 219 miles of the Ohio Turnpike was opened to traffic at 12:01 a.m. on October 1.

Linking of the entire 241-mile Ohio Turnpike with the 360-mile Pennsylvania Turnpike will provide travel between the Ohio-Indiana line and the Delaware River just north of Philadelphia over 601 miles of continuous modern toll road.

The major portion of the all-turnpike route between New York and Chicago is now a reality. Another 67 miles of that route is in operation south from New York City via the New Jersey Turnpike. By the fall of 1956 a bridge over the Delaware River to provide a direct connection between the New Jersey Turnpike and the Pennsylvania Turnpike will be completed. At the same time the Indiana Toll Road will be ready to carry traffic from the western end of the Ohio Turnpike 156 miles west to the eastern city limits of Chicago.

THE NEW D7, D8 and D9

here's what they can mean on your job

The new 286-HP CAT® D9 Tractor

Choice of torque converter or oil clutch drive. First track-type tractor with Turbocharger. Completely new 286-HP engine. "Live-shaft" drive for rear-mounted equipment. Many other important features.

The new 191-HP D8

With torque converter (Series D). With exclusive oil clutch drive (Series E). Completely new 191-HP engine. "Live-shaft" drive for rear-mounted equipment independent of flywheel clutch. New easy-working controls. Many other improvements.

The new 128-HP D7 Series C

Gear-type balancer gives six-cylinder smoothness. New 128-HP engine. Drawbar pull now 28,700 lb. maximum. New starting engine for simpler, easier operation. Track shoes hardened by "water quench" process. And many other important advances.

The year's biggest news on tracks: Caterpillar's three great new Diesel Tractors.

They're big news because they give you greater power and better performance than ever before.

The D9 and D8, for example, give you your choice of torque converter or exclusive oil clutch drive so you can best match your machine to your own job requirements.

All three give you features like one-piece frame-steering clutch case assemblies, and track shoes specially hardened by a new "water quench" process which means longer shoe life.

All three are easier to operate, with simpler, more powerful starting engines, easier working controls and other improvements.

They're easier to service, too; an exclusive trouble-free oil clutch, separately removable power train components and a fuel system that needs no adjustments in the field are only three of many reasons why.

Better be sure you get *all* the news about the new D7, D8 and D9. Call your Caterpillar Dealer today. Or mail the coupon below.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

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MAIL TODAY!

CATERPILLAR TRACTOR CO., Peoria, Illinois, U.S.A.

I'd like *all* the big news about the new D7, D8 and D9.

Name _____

Company _____

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THE NEW D9, D8 AND D7 —EXAMPLES OF CATERPILLAR LEADERSHIP IN ACTION

MARION 43-

Good Right Arm for Contractors who need to

GET SET NOW!

For

Tough Jobs Ahead!

This MARION 43-M, on a basement excavation job in the northwest, carries 1¼ cu. yd. dragline bucket on 50-foot boom. Removable counterweight is power raised and lowered.

MARION / MARION POWER SHOVEL COMPANY
MARION, OHIO, U. S. A.

POWER SHOVELS FROM ⅜ TO 60 CUBIC YARDS • DRAGLINES • CLAMSHELLS • LOG LOADERS
PILE DRIVERS • WALKING DRAGLINES • CRANES, CRAWLER & RUBBER MOUNTED • BACKHOES

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WHY-
GET SET NOW!

MORE TIME to (1) compare equipment (2) familiarize men with equipment before big jobs begin (3) work out financing details without delays (4) give new equipment its "shake-down" runs.

GREATER AVAILABILITY of (1) machines to choose from (2) erection men to assemble machine and train your men (3) front-end equipment to fit your needs exactly.

WHY-
43-M!

The MARION 43-M is today's outstanding 1 cu. yd. all-purpose heavy-duty machine. Many extra-value features. Carries 1¼ cu. yd. shovel dipper in stockpiling. A 27-ton lifting crane. With torque converter, serves as 1¼ cu. yd. hoe, 1½ cu. yd. dragline. Ask your MARION Distributor for Bulletin 415 for 12 pages of pictures and facts about a machine designed and built for big production on the heavy-duty big jobs ahead.

USE THIS CHECK LIST TO GET SET NOW!

	Shovel (Cu. yds.)	Crane (tons)	Hoe (Cu. yds.)
MARION 32-M	¾	17½*	¾
MARION 43-M	1	27*	1–1½
MARION 362	1½	37	1½–2
MARION 372	—	43	—
MARION 83-M	2	60	2–2½
MARION 87-M	—	75	—
MARION 93-M	2½	80	—
MARION 101-M	3	84	—
MARION 111-M	4	169	—

*Rated at 10' in accordance with general practice

Workhorse . . .

Continued from page 43

had only four skippers, according to Capt. George Swanson, its present commander. First man to command the dredge was Capt. John Webb. He was followed by Fred Sarzen, Ed Adams and Swanson.

So far as anyone knows, the end of the *Gaillard's* career is nowhere near. When this was written, the dredge was working to deepen an area 2,000 x 900 feet in the canal which leads from Portage Canal and the Harbor of Refuge into Lake Superior. This area previously was dredged to 28 feet in 1937, but shoaling since occurred sufficiently to menace ore boats which, especially during autumn storms, pass through Portage Canal rather than use the center of Lake Superior around the Upper Peninsula of Michigan.

Shoaling at Portage Canal consisted mostly of hard sand and mud, washed in from the upper entry and deposited over some of the hardest material on the lakes. The natural bottom was a hard cemented conglomerate, with cobbles up to 12 inches in diameter held in the cementation. There was even some pure float copper in the form of nuggets, bright and shiny as a new penny, in the material. In removing the shoal through this area, the *Gaillard* occasionally dug down into the parent material.

The area is protected from weather, so that sustained operation is possible. Fuel oil was barged down from Duluth. The dredge made the 180-mile tow from its home port in about 30 hours. Using three dump scows of 590-yd. capacity each, the veteran dredge kept one alongside being filled, one on its way out into the lake behind the tug on its way to be emptied and one on the site for standby service if needed. The dredge was removing about 4,000 cubic yards per 16-hr. day, digging shoal material from a bank under 5 feet in height. In a heavier bank it would do even better.

Two tugs service the *Gaillard*. The powerful tug *Marquette* stood by to tow the dredge and other heavy tows. A smaller tug, the *Houghton*, handled empty and loaded scows and hauled material and supplies.

Maintenance of the 40-yr. old equipment, which never has been duplicated, is an interesting problem. The equipment, however, has not required too much repair. The crew installed a 15-in. lathe aboard to make small spare parts if necessary. Some of the original machinery has had nothing except adequate lubrication for all these years. There has not been a single year since it was built that the dredge has not been busy during all or part of the summer season.

STANDS UP TO SEVERE USE

and even abuse

One word describes a Hayward — *ruggedness.* Yes, it's as tough, strong, sturdy as a bucket can be — and even more so. Extreme simplicity, little if any upkeep, high operating efficiency! Details on request. Write! THE HAYWARD COMPANY, 50 Church St., New York 7, N.Y.

HAYWARD BUCKETS

CLAM SHELL • ELECTRIC • ORANGE PEEL • GRAPPLES

famous for performance since 1888

Pipeline . . .

Continued from page 39

vided in fixed camps at the five pumping station jobs.

Housing for the two mainline pipeline spreads was provided by trailers. As the pipeline progressed, the camps moved, setting up at 75 mile intervals.

An act of heroism was recorded July 11, 1954 when Francis Kirch, driver of a pipe delivery truck, saved three persons from drowning in the frigid Chistochina River. Kirch came upon the scene shortly after the automobile carrying a man, wife and child left the bridge and crashed into the river. After tying down his horn to attract attention, Kirch crawled to the submerged vehicle by using a tow chain attached to his truck. He brought all three persons to safety.

Soaked in the 32° water, Kirch established the well being of the family, changed clothes, drank a cup of hot coffee and continued his delivery job. . . .

And another pipeline was rushed to completion.

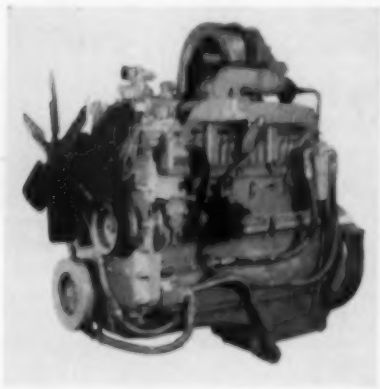
Some pictures on pages 33, 34, 35, 38 and 39. Courtesy, U. S. Army.

Equipment You Ought to Know About

Turbocharged Diesels

Manufacturer: Cummins Engine Co., Inc., Columbus, Ind.

Claims: Production of two new turbocharged diesel engines, the Cummins NTO-6 and NT-6 Turbodiesels, is announced by the manufacturer. Now available for automotive, off-highway, industrial and marine applications, the NTO-6 develops 262 hp while the NT-6 is rated at 210 hp. Maximum



speed of both is 2,100 rpm. Both the NTO-6 and the NT-6 Turbodiesels receive their increased power with the addition of a turbocharger.

Both new units are six cylinder, 4-cycle engines with a bore and stroke of 5⅛-in. x 6-in. and a piston displacement of 743 cubic inches. Compression ratio for both engines is 15.5 to 1, while the weight for both is 2,546 pounds.

Turbocharging, which harnesses exhaust gases normally wasted, produces this extra 50 hp by achieving a more perfect air-fuel mixture in the combustion chamber.

The turbocharger itself is a simple gas turbine located in the exhaust system. This turbine is connected through a common shaft to a centrifugal blower. Expansion of the exhaust gases in the turbine chamber puts exhaust heat to work by rotating the turbine blades, shaft, and blower at high speed. By creating pressure in the engine intake manifold, the blower packs a greater weight of air into the cylinder. This additional air allows a greater fuel charge to be burned completely, thus creating additional horsepower.

Turbochargers on the NTO-6 and NT-6 engines are available mounted either on the side or top.

The Cummins NTO-6 and NT-6 Turbodiesels include the latest refinements and developments based on the company's long experience in the manufacture of light weight, high speed diesel engines. Some of the features of the two new units are:

A fully counterbalanced crankshaft which is drop-forged from alloy steel. Bearing journals are induction hardened. The crankshaft is protected from torsional vibrations by a viscous-type vibration damper mounted on the front end of the crankshaft. Main bearings are steel-backed precision type, copper lead inserts with a total area of 192 square inches.

Standard equipment on the NTO-6 and NT-6 series of engines is the new Cummins PT Fuel System. This fuel system permits operation on all commercial diesel fuel weights, although No. 2 diesel or furnace oil is recommended, for lowest operating costs. The PT Fuel System provides positive governor control for both idling and maximum speed.

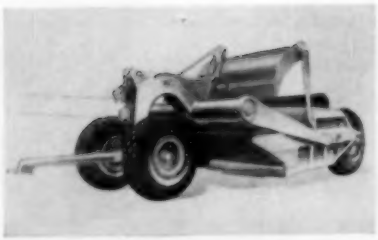
The water pump on both of the engines is the circulating centrifugal type, driven by two V-belts. The electrical equipment includes a 12/24 volt system with a 24-volt starting motor; 50-amp. generator; series parallel switch; voltage regulator; and push button starting switch.

Crawler Drawn Scraper

Manufacturer: Caterpillar Tractor Co., Peoria, Ill.

Claims: A new crawler-drawn scraper is being introduced to Caterpillar's line of earthmoving equipment, according to the manufacturer. Of the new Lowbowl design, the No. 463 scraper is the second largest in the company's line.

The new scraper has a struck capacity of 18 cubic yards and a heaped capacity of 25 cubic yards. The longer, wider bowl affords greater volume and greater heaped capacity. Lower sides to the scraper have been designed to give less



loading resistance because incoming material meets less overhead weight. Low lifting height also reduces internal friction.

Company engineers have taken into account the fact that the first few yards loaded into any scraper are fast and lifting height is negligible. Material friction at this point is low. As the load grows, resistance increases and time to pick up each additional yard becomes longer.

Lowbowl construction is designed to give the new scraper a faster loading rate throughout the loading cycle. Horsepower is utilized more efficiently with less loading resistance.

Dozer-type ejection is used. Adjustable ejector guide rollers, protected cables and straddle-mounted rear wheels with adjustable axle height are some of the features of the No. 463.

Adjustable rear axles provide clearance for various tire sizes. The adjustable axles also allow the cutting edge to be leveled when rear tires are of different diameters.

The new cable-operated scraper has a load capacity of 55,000 pounds.

International Trucks

Manufacturer: International Harvester Co., Chicago, Ill.

Claims: A new line of trucks that combines design with new, rugged power and durability was announced by the manufacturer's motor truck division.

Designated the S-line, the new models include a complete range of four and six-wheel gasoline and LPG-powered motor trucks ranging in gross vehicle weight rating from 4,200 to 33,000 pounds.

New appearance and cab comfort, a wide range of color combinations and performance are leading features of the new line. Light and medium-duty truck specializations are offered in the S-line.

S-line models range from the light-duty S-100 series through the heavy-duty S-180 series. The line includes a wide range of pickup, panel and stake models with factory-mounted, added-

Continued on page 56

NEW OUTPUT ABILITY

with the ALLIS-CHALMERS HD-11G TRACTOR SHOVEL

2¼-yd capacity
105 net engine hp
32,000 lb
11-ft, 7-in. dump height

NEW POWER is provided by the modern, 105-hp Allis-Chalmers diesel. Tornado Turbulence and "follow-through" combustion mean cleaner burning and more power from fuel, as well as smoother engine performance and extra long engine life. Added power pays off in extra crowding and digging ability, fast work cycles.

NEW CAPACITY. Big 2¼-yd bucket is streamlined to roll in large loads more easily. Improved design cuts spillage, clean dumping saves time and effort shaking out loads. Optional 2¼-yd tip-back bucket rolls back 25 degrees at ground level, handles bigger loads of loose material.

NEW STABILITY. Extra-long track — with almost 9 ft of track on the ground — plus 8 truck wheels on each side and 32,000 lb of weight, give the HD-11G unusual stability, plenty of traction.

NEW-TYPE HYDRAULIC SYSTEM is simpler, safer, easier to maintain. Tank has fewer external fittings. Magnetic filters and suction-line screens protect entire system. Hydraulic pump offers fast action, long life.

NEW OPERATOR CONVENIENCE. The HD-11G features easily controlled, accurate bucket action; reduced lever pull with new-type clutch; full vision; roomy platform; foam rubber seat; 60-gal fuel tank.

NEW DEPENDABILITY AND SERVICING EASE result from such features as heavy-duty truck wheels and idlers; new, long-life track; new-type, long-lasting, ceramic master clutch lining; unit construction's quick disassembly and assembly of major parts; 1,000-hour lubrication intervals for roller bearing truck wheels, support rollers, idlers.

CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

Stop in soon and see the production-boosting HD-11G at your Allis-Chalmers dealer's.

ALLIS-CHALMERS

NOT in the Contract

The smiling girl sat in the rear of the church, waiting for her ex-girl-friend to be married to her ex-boy-friend.

"She's my worst enemy," the girl hissed to her companion. "Why else do you suppose I let her take him away from me?"

When his engine conked out, the pilot of the light plane glided to a landing on the state thruway. The only car in sight pulled off the road when the driver saw the plane coming in. After rolling to a stop, the pilot jumped out and walked back to the car to thank the motorist for his cooperation and to ask for a lift to the closest interchange. As the pilot neared the car, the woman sitting beside the driver stuck her head out the window and said to him, in great agitation:

"We'll get out of the way if you'll just show us where to go, mister. This clown here is the only driver in the country who could start out on the thruway and wind up in the middle of an airport."

Bill Smith is due at work at nine in the morning and crawls in at ten. His face is battered in; his teeth are knocked out; his jaw is dislocated and he is limping.

"Do you see the clock?" thundered the boss. "It's 10 a.m."

"Yes, I know," explained Bill, "and I'm sorry. You see, sir, I fell out of a window."

The boss sneered, "That took you an hour?"

An old mountaineer and his son were sitting in front of the fire smoking their pipes, crossing and uncrossing their legs. After a long silence, the father said:

"Son, step outside and see if it's raining."

Without looking up, the son replied:

"Aw, Pa, why don't we jest call in the dog and see if he's wet?"

"How is your wife?" the man asked an old friend he hadn't seen for years.

"She's in heaven." replied the friend.

"Oh, I'm sorry." Then he realized that was not the thing to say, so he added, "I mean I'm glad." And that was even worse. He finally came out with, "Well, I'm surprised!"

A Texan complained bitterly when told to drop 35 cents in the coin box when he made a telephone call between Rhode Island and Connecticut.

"Why, back home we can talk to hell and back for a dime," he protested.

"Maybe so," said the operator, "but from Texas that's a local call."

After introducing himself to a pretty girl at a dance, a fast-working young man said:

"Won't you give me your phone number?"

"It's in the phone directory," she said.

"And what's your name?"

"That's in the phone book too."

A group of convivial Irishmen were breaking up after a grand party and began to see each other home. Eventually they arrived at Casey's house and hammered on the door.

Mrs. Casey put her head out of the window and asked what was wrong.

"Come down, Mrs. Casey, for pity's sake," was the reply, "and tell us which of us is Casey. The rest of us want to go home."

Judge, to the very thin girl: "I'm sorry, but I can't issue a marriage license until you have properly filled out your form."

Girl: "Listen, if my boy friend doesn't care, what business is it of yours?"

Olsen and Schultz went into a bar.

Bartender: "What'll it be, boys?"

Schultz: "I dink I'll haf a leedle shin."

Olsen, to the bartender: "What you tink of Schultz here—he's bane in dis country saventeen year now and can't say yin yet!"

"Ouch!"

Down time is no joke.

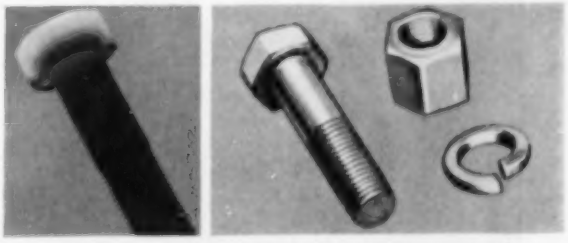
But it happens at times when track hardware gives out.

If you replace with genuine Caterpillar hardware, here's what you're sure of: bolts, nuts, capscrews and lock washers made from prechecked fine-grade steels, carefully hardened and tested, finished to the strictest specifications in the industry. You're sure of longer wear life, no matter how tough your jobs come. You're sure of *less* down time in the future.

If you replace with non-genuine hardware—can you be sure of anything?

Better get Caterpillar parts every time.

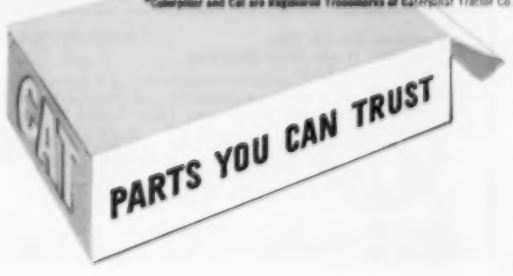
Caterpillar Tractor Co., Peoria, Illinois, U.S.A.



On the surface, CAT® hardware looks like ordinary kind. But etched cross section of newly designed track bolt (left) shows depth of special "Hi-Electro" hardening penetration in bolt head.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.



12,587 carloads of

American Steel & Wire
Room 842, Rockefeller Building
Cleveland 13, Ohio

FREE ROPE BOOKLET →

Please send me, without obligation, a copy of your booklet, "The Right Rope for the Job," which lists the correct Tiger Brand Ropes to use for hundreds of typical applications.

Name .....

Address .....

City & State .....

overburden moved with one Tiger Brand Hoist Rope

IMAGINE 12,587 50-ton freight cars strung out end-to-end. They would make a train more than 80 miles long; and if each car was level full, the entire train would contain 1,000,000 cubic yards of material. That's how much overburden this big coal stripping shovel moved with one American Tiger Brand Hoist Rope.

Despite hard digging, a 2⅜" Tiger Brand Wire Rope lifted and lowered the fully loaded 45 cu. yd. bucket *20,000* times before it had to be replaced. This equipment is used by Central Ohio Coal Company which supplies coal for The Ohio Power Company's new Muskingum River electric power generating plant. This company also uses Tiger Brand Wire Rope on its 18 cu. yd. shovels.

You will like Tiger Brand, too. It lasts long in *any* type of service.

Send the coupon for our recommendations of the right rope to use on your machines.

Regular lubrication of sheaves helps prevent excessive wear of the Tiger Brand Ropes on these big machines.

This 18 cu. yd. electric shovel and the 45 cu. yd. job shown on the opposite page are stripping overburden 3 shifts a day *every* day at Central Ohio Coal Co.'s big Muskingum Mine near Zanesville, Ohio. Tiger Brand Rope is giving excellent service on both these hard-working machines.

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL CORPORATION
GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO · TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

U·S·S AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

USS

UNITED STATES STEEL

New Equipment . . .

Continued from page 50

capacity bodies. The company pointed out that in many instances the new models have larger engines and a number of new functional features as standard equipment, which were available only as optional equipment at a higher price in previous models. The larger engines with increased horsepower have been made standard equipment to provide maximum usable horsepower for normal truck driving requirements.

Twenty-three of the S-line conventional four-wheel models, three six-wheelers, six cab-forward models, and the S-160 (4x4) are available with LPG engines.

Cut-Fill Markers

Manufacturer: Hargus Markers, Brawley, Calif.

Claims: A new kind of grading marker has been developed by W. D Hargus, a surveyor.

The marker is a heavy water resistant paper sleeve which is placed over a stake. The sleeves are clearly marked graphically so that the excavating operator can read them as far as 600 feet away.

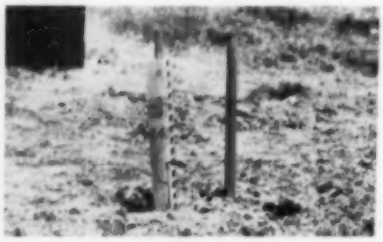
Because the markers have varying border widths which give the amount to be cut or filled, errors of judgment

can be eliminated. The equipment operator can check the amount to be cut or filled by glancing at the marker.

A border of black at the bottom of the marker designates the fill wanted and the top of the border indicates the finished grade. The marker used to designate fill has an "F" at the top in black on a white background. Under the "F" is a numeral indicating in increments of tenths of feet how much is to be filled.

Cut markers are marked at the top with a "C" and also use a border to designate graphically the depth of cut at the stake. Obviously, the finished grade cannot be indicated directly for it is below the surface of the ground. However, the next best thing is done. The bottom of the cut border automatically falls one foot above the finished grade when the bottoms of the markers are placed at the original rod reading elevation. Cut markers are printed in red.

This reference plane is automatically set one foot above the finished grade



where cuts are less than one foot. If a deeper cut is desired a slight modification of this method will produce the same results.

The marker is made of waterproof paper and glue and slips over the regular wooden stake normally used in land leveling. The paper is specially treated to withstand most extreme weather conditions.

The markers are open at both ends and slip over a stake forming a paper cylinder or lying flat according to orientation. They are fade resistant and have proved to last from two to three months and maintain maximum visibility in wind, sun, and water.

Diesel Powered Tractor Shovel

Manufacturer: Clark Equipment Co., Benton Harbor, Mich.

Claims: The Michigan Model 175A rubber-tired tractor shovel now comes equipped with a turbocharged diesel engine rated at 165 hp, Clark's construction machinery division has announced. The new tractor shovel is capable of operating at high altitudes with ample power.

The turbocharger uses hot exhaust gases to drive a turbo-compressor, which packs air into the cylinders to improve combustion and boost power. Although new in power plants for construction

machinery, the principle has been applied to aircraft engines to maintain high performance in thin air at high altitude.

The new model, with 2½-yd. bucket capacity and weighing 24,100 pounds, has four-wheel drive and rear-wheel steering. It features the Clark power train, with a torque converter, power shift transmission and planetary-wheel drive axles. The three-to-one torque multiplication provided by the converter makes an increasing flow of power available when needed. The Model 175A has four forward and reverse speeds, with a maximum of 27 mph.

The planetary-wheel drive axles reduce torques on the axle shafts 70% and put the final power multiplication where the tractive effort is applied.

Aggregates Mixing Unit

Manufacturer: Iowa Mfg. Co., Cedar Rapids, Iowa.

Claims: A new delivery conveyor attachment that thoroughly mixes water and calcium chloride with aggregate before it is discharged from surge bins or gravel plants into a truck body has been announced by the manufacturer.

Crushed aggregates mixed with water and calcium chloride provide a gravel or crushed rock road surface that is free from dust, that compacts to a smooth hard surface and remains relatively stable. The same aggregates are also used for building stabilized bases for bituminous surfaced roads. The Cedarapids mixing unit eliminates the need of other sprinkling or spraying equipment on the road bed and provides controlled proportioning of calcium chloride and moisture.

The mixing unit, called the Cedarapids Volumetric Proportioning Continuous Mixing Type Pugmill Attachment, fits under the head pulley of a delivery conveyor. Optional equipment which adapts the unit to various road surfacing methods include a calcium chloride feeder, a water meter, a quick-close valve and a water pump.

An 18-paddle pugmill which thor-

oughly mixes the material and discharges it into the truck body is contained in the unit. Also included in the mixing unit is a 2-in. spray bar to spray the proper amount into the aggregate as it is mixed.

The calcium chloride feeder, which is used in most installations, consists of an enclosed bin unit and a short conveyor belt to add a controlled amount

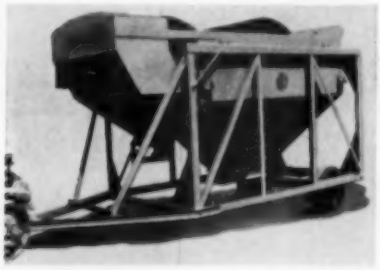
of calcium chloride to the aggregate on the delivery conveyor belt. This unit is driven by the conveyor power unit.

The new equipment can be added to the delivery conveyors of all types of portable and stationary surge bins and is available on special Cedarapids 5 and 10-yd. portable bin units. With special adaption, the unit can be fitted on the delivery conveyor belts of portable gravel crushing and screening plants.

Portable Batching Plant

Manufacturer: Construction Machinery Sales Co., Waterloo, Iowa.

Claims: The new portable batching plant called Conveyex for batching to truck mixers has been announced. Primarily designed for smaller plant operators, bigger plant operators who need an auxiliary portable set-up to shorten the haul on jobs in outlying areas and with contractors for bridge w rk, hous-



ing projects and similar jobs will find the new plant of value, the manufacturer reports.

With two or three compartments which can be readily loaded with a front end loader, the new unit batches each aggregate separately into a troughing belt conveyor for charging mixers. Scale is of the decumulative type which comes

Continued on page 60

720 TONS . . . AN HOUR'S HAUL WITH THIS
SAUERMAN TOWER EXCAVATOR

Pioneer's giant excavator is the largest power scraper installation in the sand and gravel industry.

Pioneer Sand and Gravel Co., Seattle, Wash., needs a huge flow of material to supply its ready-mix plants and barges. They're getting it with a 12-cu. yd. Crescent Scraper.

The Crescent handles 480 yds. or 720 tons per hr. over an average haul from 300 to 350 ft. It operates along a 675-ft. span between movable head and tail towers located at the base and top of the 240-ft. high bank.

In addition to high rate of delivery, adoption of the Sauerman Method provides two other advantages over the 5-cu. yd. power shovel that formerly operated off the "toe" of the bank. These are: (1) material can now be taken from anywhere on the bank for blending and selection of gravel, and (2) material can be moved down the slope with no danger of cave-ins.

The tower excavator at Pioneer is mounted on portable towers and engineered by Sauerman for economical excavation in this type of deposit. This same digging tool . . . the Crescent scraper . . . can be engineered to your operation to give you equivalent high production at low cost.

Sauerman Scrapers range from ½ cu. yds. up to 18 cu. yds.

Because in most cases it is cheaper to drag material than it is to lift and transport it, *they give you the lowest cost per cu. yd. handled.*

Contact us for information and specific recommendations. Ask for field reports and Catalog A.

This view gives some conception of the height and steepness of the bank on which the Crescent works.

The Crescent delivers to a portable field hopper from which belt conveyors transport the material to the plant.

SAUERMAN BROS. INC.
622 S. 28th AVE. BELLWOOD, ILL.
Crescent Scrapers • Slackline and Toutline Cableways • Durolite Blocks

THE WORLD OVER... BUCYRUS-ERIE

IN VENEZUELA,

IN CALIFORNIA,

IN BRITISH COLUMBIA,

Ward Leonard Electric Shovels

HELP PUT THE LID ON RISING COSTS

In every design and construction feature Bucyrus-Erie Ward Leonard electric shovels are built to save you money. They have the capacity and performance ability to deliver high output at an economical cost per yard.

Modern front-end design eliminates dead weight, lets power work effectively swinging payloads. Boom strength is greatest where it's needed most to withstand digging and swinging stresses. Ward Leonard control results in fast acceleration and deceleration, provides extra torque and ample usable power. Heavy-duty construction keeps maintenance costs down and adds years to machine life.

All over the world — in mines, in quarries, and on big construction projects — Bucyrus-Erie Ward Leonard electric shovels are being used to handle the toughest digging and loading assignments. Those who use them know that Bucyrus-Eries, with their fast operating cycles and durable construction, provide the dependable high-output and low-cost performance that means profitable operation.

69L55C

BUCYRUS ERIE

South Milwaukee
Wisconsin

1880 75 1955
YEARS OF SERVICE
to Men Who
Shape the Earth

IN WISCONSIN, a 4½-cu. yd. Ward Leonard electric shovel handles excavating and loading in a quartz and granite quarry.

IN MOROCCO, an 11-cu. yd. Ward Leonard electric shovel digs and loads phosphate and rock into a portable processing plant.

Double Duty

BUCYRUS ERIE

Churn Drills Chase Idle Time

You get real profit potential with Bucyrus-Erie 20-W or 22-W churn drills. These versatile rigs reduce idle time during slack periods because they can do two kinds of work.

Blast Hole Drilling. By simple direct-drive drilling motion these rigs put down 4- to 8-inch holes at low per-foot cost. All-steel welded construction reduces repair bills to a minimum.

Water Well Drilling. Easy mobility plus snappy drilling action make the 20-W and 22-W ideal for water well drilling during off periods. Both machines have plenty of spooling capacity for deep drilling.

Whether drilling blast holes or water wells, the 20-W and 22-W give outstanding performance. Write for additional information today.

53W55

BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

New Equipment . . .

Continued from page 57

back into balance as the indicated amount is discharged from each compartment.

The unit is offered with separate cement compartment and scale beam. The cement handling unit can be used with bag cement, but is more effective when bulk cement is employed. A dust cover for the conveyor is available when desired.

Tractor Developments

Manufacturer: American Tractor Corp., Churubusco (Ft. Wayne), Ind.

Claims: Two developments in its tractor line—a new all-hydraulic instant-shift transmission and torque converter drive—are being introduced, according to the manufacturer.

The new transmission is a constant-mesh gear train, combined with hydraulically-operated clutches, which provide automatic shifting in any speed or direction, without loss of momentum. The unit provides four speeds forward up to 5.63 mph and four speeds reverse up to 6.2 mph.

Another advantage of the new transmission is that it permits full power-turns with the touch of a finger, or smooth pivot-turns with hydraulic foot brakes. In both cases, hydraulic clutches provide control and maneuverability. Four new crawler models with a two-stage hydrokinetic-type converter, produced by the Long Mfg. Div., Borg-Warner Corp., are being featured. The converter is especially engineered for operating with Continental diesel and gasoline engines, which are used for powering TerraTrac crawlers.

Largest of the 12 new TerraTrac crawler models now being offered is the new model 600. Combining both Terramatic transmission and torque converter drive as standard equipment, this unit also features a heavy-duty track assembly with oversize sprockets and gears. It is said to develop up to 15,860 pounds of drawbar pull with adequate weight and traction.

Additional equipment available at extra cost with the Terramatic-driven model 600 include: a new 1-yd. loader; 72 x 31-in. bulldozer blade; 88 x 31½-in. angling dozer blade; hydraulic backhoe with choice of bucket sizes; plus a new 10,000 lb. 4-speed winch, hydraulically controlled from the operator's seat.

TerraTrac is also offering a new model 500 crawler, which brings the advantages of torque converter drive for the first time within the reach of small and medium-size operators.

Bulldozer Attachment

Manufacturer: Austin Div., Central Ohio Steel Products Co., Galion, Ohio.

Claims: A bulldozer attachment, suitable for mounting on Model 2-C, 4-C, 6-C, 7-C and 8-C Austin Overshot Loaders, is announced.

With the new attachment, the machine can be used for grading, back filling and other dozing jobs as well as for digging, loading, screening and stockpiling material.

According to the manufacturer, the attachment is interchangeable with Austin standard or front-dump buckets. Blade tilt adjustment is 15° on loaders

equipped with standard buckets and 45° on front dump bucket-equipped machines. Blade and end bits are replaceable.

Blade sizes and weights range from 28 to 80 inches and 475 pounds for Model 2-C to 46 x 132-in. and 3,350 pounds for Model 8-C.

Merton Overloader

Manufacturer: Merton Engineering Co., Ltd., Feltham, Eng.

Claims: The manufacturer recently announced the improved Fordson Diesel powered Merton Overloader which incorporates new features in its design.

The bucket of the new loader has a ¼-yd. capacity and covers the full width of the front wheels of the tractor. The bucket is operated by means of winches and cables. Winches are

mounted above the rear wheels on either side of the driver's cab and are controlled by one lever which operates both the winch drive clutch and the winch brakes. The drive to the winches is taken from the front of the engine and is therefore independent of the master clutch.

Digging depth of the bucket can be adjusted, by the removal and replacement of two bolts, to any position between two inches above ground level and four inches below ground level.

The discharge height of the Merton Overloader is variable. A small hand operated winch raises and lowers the overhead structure. The bucket can be discharged at any height from a minimum of 6 ft. 11 in. to a maximum of 11 ft. 2 in.

The reach of the bucket is 3 ft. 6 in. when in the minimum discharge position and two feet when in the maximum discharge position.

The enclosed cab on the Merton Overloader is constructed of heavy gauge sheet steel and fitted with toughened safety glass windows. The turning radius of the Overloader is 17 ft. 6 in.

A light 1-yd. materials bucket is available as optional equipment. Other optional equipment includes a 6-ft. 9-in. bulldozer blade and a one ton capacity crane hook attachment.

Seaboard Equipment Co., 7 Hanover st., New York, N. Y., is representative in the U. S. and Canada for the manufacturer.

Scarifier Disc Plow

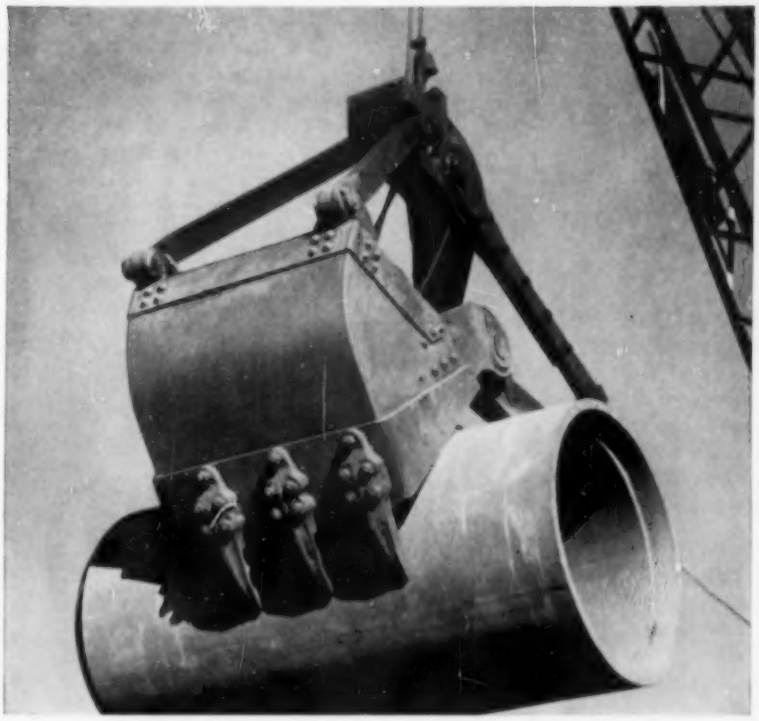
Manufacturer: Towner Mfg. Co., Santa Ana, Calif.

Claims: Designed for use on such jobs as cutting fill on dams, levees and roads and for loosening dirt in borrow pits, the Scari-Plow is being introduced by the manufacturer.

Giant 28-in. diameter disc blades support 300 to 400 pounds of plow per blade. Each disc blade has 10 cutting notches, and with the pressure with which the blades contact the ground

"OUR ERIE STRAYER BUCKET IS THE MOST VERSATILE TOOL WE OWN"

● **States Edward J. Petrillo, President, Edward J. Petrillo, Inc.**



On the job photo shows an ERIE bucket's no-slip grip on concrete pipe being moved at Edward J. Petrillo, Inc. on the New York Thruway.

The change-over from clamshell bucket to grappling hook costs time and money—to say nothing of the extra man needed to work the hook. That's where an ERIE bucket's versatility pays extra dividends.

Like Mr. Petrillo, many satisfied owners use their ERIE not just to dig and load sand and gravel, but to move boulders, sewer pipe, steel girders, concrete slabs, logs, and old lumber.

An ERIE Strayer bucket is nimble, too. Its great power is perfectly balanced and easily controlled. Operators appreciate this feature—especially when digging in corners, along edges or loading hoppers in tight quarters.

These better buckets provide these *"wanted"* features:

1. **Top closing power from block and tackle, plus lever arm construction, plus precision balancing.**
2. **Manganese steel teeth and high carbon steel lips that bite up full payloads of even toughest clay and gumbo.**
3. **Rigid, one-piece, welded head that shrugs off bumps and jars. No shimmy. No wobble.**
4. **Two-line, continuous reeving. Adds up to 50% to cable life. Less down-time for reeving.**
5. **Low head room for fast work in tight quarters; low center of gravity for easy positioning.**

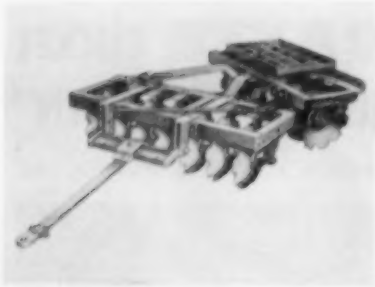
For catalogs, write Dept. E115 Cable Address: EXIMPORT

ERIE

BUILDERS THE WORLD OVER

ERIE STRAYER CO.

9115 GEIST ROAD • ERIE, PENNSYLVANIA



penetration of the soil and mutilation of heavy trash is accomplished.

The new plow can be used for loosening dirt for fill. It penetrates borrow pits evenly. Soil is cut finely also to allow the dirt to be spread evenly.

In binding layers of soil, the soil is churned so that layers are blended and there is no lamination. In this, as in soil packing, the mixing action of the disc blades eliminates air pockets.

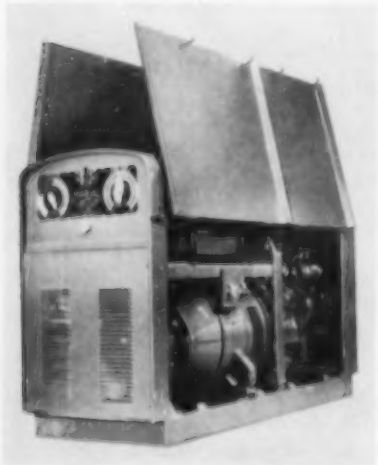
The low draft line of the new unit assures equal penetration of all disc blades and may be used in mixing water into the lower layers of soil on highway or dam projects.

Diesel Driven Welder

Manufacturer: The Lincoln Electric Co., Cleveland, Ohio.

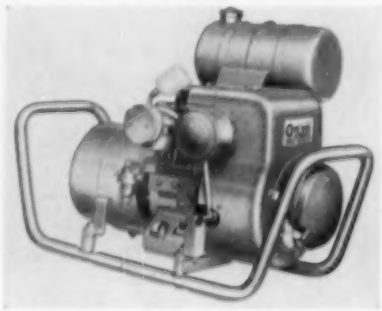
Claims: A new diesel-powered welder for construction, pipe line and structural welding has been announced by the manufacturer. The welder, called the "Shield-Arc SAE-250," is rated 250 amperes at 40 volts, 60% continuous duty cycle. It features diesel-powered welding capacity in a relatively compact design.

The machine is an addition to the company's line of dual continuous control welders which provide regulation of both voltage and amperage throughout the entire output range. The arc can be controlled as to type as well as intensity to permit welding in all positions and under varying conditions of field welding. It has a range of 50 to 250 amps., handling electrodes from $\frac{1}{8}$ to $\frac{1}{4}$-in. diameter. An improved fuel system of the engine maintains accurate current output both in arc striking and throughout the range of the welder. From no load to full rated load, speed variation of the engine is regulated to less than 3½%. The welding generator is equipped with power outlets to provide 115 volts DC auxiliary power for operating tools and lights.



The welder is powered by a new Hercules diesel engine, the DIX-4D. This is a four cylinder, four cycle engine with 166 cubic inch displacement, rated at 39 hp at 1,700 rpm. It is equipped with a 12 volt starting motor and an ether injection system for cold weather starting.

Portable Electric Plant



Manufacturer: D. W. Onan & Sons Inc., Minneapolis, Minn.

Claims: Another lightweight new model in the series of portable electric generating plants has been announced by the Minneapolis firm.

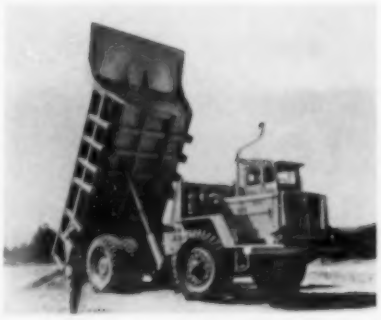
Model 105AK is a lightweight 1,500-watt, 60-cycle, AC electric plant. Offered in two versions: Model 105AK-1P, weighing 125 pounds, equipped with tubular aluminum carrying frame as standard equipment; and Model 105AK-1M, weighing 130 pounds, designed for stationary service but with carrying frame and 2-wheel dolly optional.

The generator is direct-connected to a 4-cycle air-cooled gasoline engine. The unit will run for about three hours on one gallon of gasoline at full rated load.

Two-Axle Dump Truck

Manufacturer: Kenworth Motor Truck Corp., Seattle, Wash.

Claims: A new 40-ton spring-mounted dump truck known as the



Kenworth 803, which is thought by the manufacturer to be the largest two-axle dump truck, is now being produced.

Engineered for the big off-highway hauling jobs in open pit mining and earth or rock moving, the new 803 dwarfs previous Kenworth models. Struck capacity is 24 cubic yards. Heaped load (2 to 1) is 28 cubic yards. With a gross vehicle weight rating of 150,000 pounds, the chassis weight of the 803 with body is 68,000 pounds. The vehicle measures 12 feet across the front hubs, and is 14 feet off the ground over the one-man cab shield.

Powered by a single diesel engine, which will vary between 300 and 500 hp. depending on the grades of the loaded haul, the unit maintains all the advantages of a two-axle, single-axle drive truck. Turning radius is 36½ feet, with a turning angle of 30°. The front axle capacity is 50,000 pounds, with an 8-in. I beam center section. The front axle, itself, weighs 5,466 pounds. The 100,000-pound-capacity rear axle is designed for wheel bearings of an 8-in. bore. The drive axle is a full floating, double reduction type in which the first reduction is a spiral bevel drive unit and the final reduction is through planetary gears in each wheel. The springing system features unique variable rate front springs. In addition to being rubber mounted at the ends, the four front springs have steel seats set inside the rubber that shorten their effective length when loaded. In an unloaded condition the truck rides on rubber and in the loaded position the rubber block is relieved by the flattening of the spring arch, resulting in a shorter, stiffer spring to compensate for the additional load.

The power steering system features a full circle steering arm and has two hydraulic cylinders, the main cylinder exerting a force of 15,000 pounds. The rear brakes feature dual sets of shoes in each drum, operated by four separate air chambers.

Where parts must be

EXTRA TOUGH

specify AMSCO® MANGANESE STEEL

Amsco backhoe bucket at work

Digging! Crushing! Handling! Amsco manganese steel parts work up to 10 times longer under punishment . . . because manganese steel can easily absorb heavy impact and abrasion. Hard work toughens the metal . . . it work hardens to as high as 550 Brinell. The pounding, grating action of rock and ore only polishes manganese steel.

To get maximum life out of your equipment, specify Amsco manganese steel parts from the manufacturer.

DIGGING

backhoe buckets
dippers and parts
repointers
dragline buckets and parts
dragline chain
sheaves
pinions
crawler shoes

CRUSHING

concaves
mantles
jaw plates
mill liners
hammers

HANDLING

bulldozer blades
tractor rollers, idlers
sprockets, grouser bars
truck beds
grizzle parts
ore car wheels and liners
sheaves, gears, pinions

Amsco also produces other alloy steels with maximum wear resistance under particular conditions of service.

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Ill.

500 hp M-R-S "200 Special" with 34-yard struck capacity WOOLDRIDGE—M-R-S "OS-300-B" combinations set new records on Ohio job.

HIGH PRODUCTION AND HIGH PROFITS GO HAND IN HAND WITH THE WORLD'S

LARGEST TRACTOR-SCRAPER

C. F. Replogle Company proves new concept of big power and

Demonstrating the higher comparative productivity of mammoth 34-yard struck capacity WOOLDRIDGE—M-R-S Scrapers with 500 hp M-R-S Tractors under tough job conditions, C. F. Replogle Company put two of these huge combinations to work alongside two conventional rubber-tired tractor-scraper units of 18-yard struck capacity. Although each of the big units carried 16 more yards, they loaded in approximately the same time and actually completed each cycle faster than the smaller units!

During relocation of Highway 7 around the Ohio River Cumberland Lock and Dam Site, wet silty river bottom borrow frequently had to be disked to dry out for later compaction. Constant rains kept haul roads over the 2.18 mile job slippery and spongy. Even under these conditions, Replogle's Job Superintendent, Charlie Thompson, reported that the big combinations were getting 34-yard loads in less than one minute and 45 seconds! The exclusive M-R-S hydraulic weight transfer feature, which transfers forward weight of the scraper to the tractor drive wheels, gave the extra traction needed in the tough spots. New wide-base low-pressure tires provided the flotation and traction necessary to keep the rigs rolling safely at high-profit speeds in the soft pits, fills and haul roads. As a result,

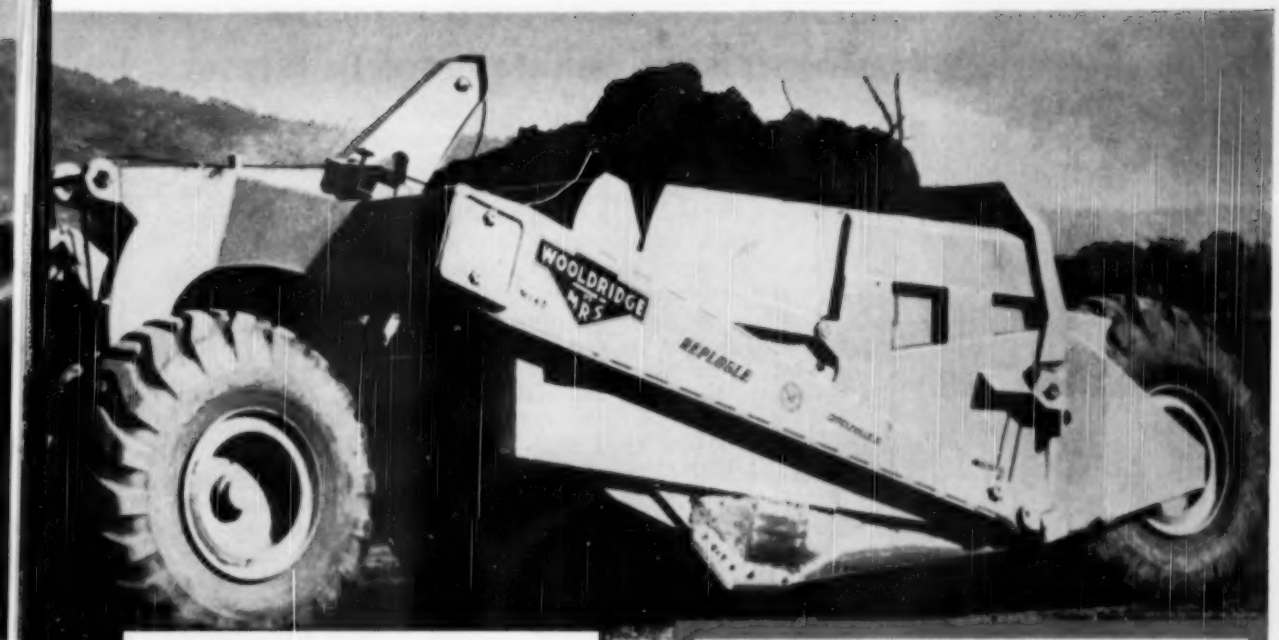
C. F. Replogle heads the Circleville, Ohio firm which has set a new milestone in earthmoving progress through successful introduction of the world's largest rubber tired tractor-scraper combination.

THE EMBLEM OF DEPENDABILITY M-R-S MANUFACTURING COMPANY

FLORA, MISSISSIPPI

THERE'S AN M-R-S TRACTOR FOR EVERY POWER NEED

TRACTOR MODEL 200 SPECIAL	500 HP
TRACTOR MODEL 200	335 HP
TRACTOR MODEL 190	288 HP
TRACTOR MODEL 150	250 HP
TRACTOR MODEL 125	210 HP



500 HP M-R-S TRACTOR

41 (heaped capacity) YD. WOOLDRIDGE—M-R-S SCRAPER

COMBINATION

capacity on tough Ohio job

these biggest of all earthmovers actually accounted for more than double the production of the other units.

C. F. Replogle Company's application of this new concept of bigger power, capacity and speed marks a milestone in lowering earthmoving costs. Other progressive contractors have come from all over the country to see for themselves how this world's largest rubber tired unit meets the problems of rising production costs. Already, more WOOLDRIDGE—M-R-S combinations are on the way to important jobs. It will pay you to study this new approach to successful bidding—with well-protected profit margins.

COMPARATIVE FIELD STUDY REVEALS HIGH PROFIT PRODUCTION OF WOOLDRIDGE—M-R-S ON DIFFICULT JOB

	WOOLDRIDGE—M-R-S Combination	Tractor-Scraper Combination "A"	Tractor-Scraper Combination "B"
Struck Capacity	34 cu. yds.	18 cu. yds.	18 cu. yds.
Trips per 50 minute hour	7.28	5.6	6.25
Loading time	1 min. 40 sec.	1 min. 34 sec.	1 min. 42 sec.
Complete cycle	6 min. 52 sec.	8 min. 54 sec.	8 min.
Production per 50 minute hour @ 80% struck capacity	198 cu. yds.	81 cu. yds.	90 cu. yds.
Production ratio based on 100% for minimum combination	244%	100%	111%

FOR THE COMPLETE BIG PROFIT STORY, CONTACT YOUR WOOLDRIDGE—M-R-S DEALER, OR WRITE DIRECT TO M-R-S OR WOOLDRIDGE TODAY!

AND A WOOLDRIDGE—M-R-S SCRAPER FOR EVERY CAPACITY

SCRAPER MODEL	STRUCK, CU. YDS.	HEAPED, CU. YDS.
OS-300-B	34.0	41.0
OS-260-B	26.0	32.5
OS-200-B	20.0	26.0
OS-152-B	15.1	18.0
OS-90-B	12.2	15.0
OS-80-B	8.4	10.5

WOOLDRIDGE

MANUFACTURING DIVISION

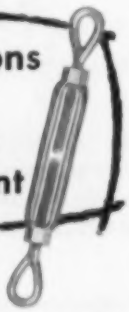
CONTINENTAL COPPER & STEEL INDUSTRIES, INC.

SUNNYVALE, CALIFORNIA, U.S.A.

Turnbuckle Allows Easy Take-up

Several important advances in design by the makers of famous Laughlin Turnbuckles offer added safety and efficiency to turnbuckle users. For fast, easy take-ups with a wrench, Laughlin turnbuckle bodies have extra-heavy hex ends. An exclusive eye design that takes the ear of a shackle one size smaller, gives the Turnbuckle double usefulness. Laughlin's exclusive eye design is stronger than conventional eyes because it conforms more closely to the lines of pull. This design also makes it easier to attach thimbles and other fittings. Redesigned Laughlin hooks have added heft at points of greatest stress. Exceptionally strong, the ¼" hook is actually stronger than most ⅝" hooks. Hot galvanized and forged from special forging steel with weldless construction, Laughlin Turnbuckles are offered in a complete range of end fittings in sizes from ¼" x 4" to 2¾" x 24". A reference chart in Laughlin's free catalog lets you select the proper size Turnbuckles for the wire ropes, chains or assemblies you use. For greater safety and strength, always specify world-famous Laughlin Turnbuckles.

Combinations For ANY Turnbuckle Requirement



For free catalog, write:

THOMAS LAUGHLIN DIVISION
American Hoist & Derrick Co.
St. Paul 1, Minnesota
makers of world-famous Crosby Clips

World's most complete line of fittings for wire rope and chain

Equipment Maintenance in Winter

Most excavating and other construction equipment is regularly used under rugged conditions. The possibility of breakdown or excessive wear multiplies, however, when extremely cold weather is added to the normal problems of protection against the elements.

Here's a few tips from the Caterpillar Tractor Co. for cold weather protection of tracked equipment. Some good common sense suggestions are given for proper care of the engine, transmission and the tracks themselves during below freezing weather. With a little forethought and planning, machinery can operate satisfactorily regardless of the intensity of the weather.

Leaking radiators, hoses, water pumps or gaskets are an invitation to trouble when the temperature drops. These should be carefully checked.

The fan belt is very important in winter if it drives a water pump. Stretched and frayed from the summer's heat it may turn its last on a zero day.

If your machine is going to vacation this winter, keep the engine rust-free with a cup of crankcase oil poured into each cylinder once a month. Crank the engine a few turns with the compression off at least once a week to restore the oil film on the cylinder walls. The same treatment goes for the starting engine; a couple of tablespoonsful of oil is sufficient.

Water in diesel fuel can cause trouble in any weather and as the temperature drops it causes freezing of the lines and filters. Properly stored fuel contains practically no water but when refueling machines in snow or rain, some can enter the fuel tank. Fill the fuel tanks at the end of the day's operation to drive out the moisture laden air and drain off a quart or so before starting the next morning. The accumulated water —if it isn't frozen—can be eliminated.

The gasoline starting engine can be a very dependable starter in any temperature if it is kept in condition. Valve and cylinder equipment must be good, otherwise hard starting or insufficient cranking power result. Avoid overchoking and fast idling speeds to promote longer life during low temperature operation. If the starting engine has a two-speed transmission, make full use of the lower speed gears when cranking a cold engine.

Replace any missing drain plugs and gaskets in steering clutch enclosures and dry flywheel clutch compartments. When operating in mud or water, these compartments can accumulate debris and mud which may freeze and cause serious damage to the working parts.

Transmissions and final drives should be flushed and refilled with fresh oil of a lighter grade, generally SAE No. 80.

Tracks, track rollers and carrier rollers require some additional attention also in colder weather. Snow frequently packs between the rails of the tracks, causing excessively tight tracks. Installation of special snow track grousers is recommended. These plates have holes in their center which eliminate packing.

Track hardware is subjected to tremendous stresses if a tractor becomes frozen in mud. Never park a machine where there is danger of freezing the tracks to the ground. A simple log berth for the machine will prevent freezing of tracks and will relieve an operator of a lot of work when the machine is to be moved.

Frozen mud around the rollers and carrier rollers lock them tight. If a machine is run any distance with frozen rollers, the track rails rub over the rollers. This may wear flat spots on the roller and render it practically useless. Cleaning the track assemblies prior to parking the tractor will lower repair costs. This is a dirty task, but it's much easier than freeing a frozen roller.

A clean, well cared for machine will pay dividends and this is especially true in cold weather.

New Trade Literature

Subject: **Motor Scraper**

Content: Engineering, design, construction and mechanical features of the new Allis-Chalmers TS-360 Motor Scraper are outlined in the new 2-color catalog. Photographs and drawings assist the reader to understand better the many advances incorporated in this 20-yd. heaped or 15-yd. struck capacity motor scraper powered by the 280-hp Allis-Chalmers diesel engine. Complete specifications of the unit are included. Ask for MS-663.

Where to get: Construction Machinery Div., Tractor Group, Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Subject: **Sauerman News**

Content: The current issue contains articles on a slackline cableway derocking a tailrace at Washington Water Power Company's Cabinet Gorge Dam; scraper storage at Notre Dame and Davison Chemical; subgrading a beach at Honolulu and deepening a New Zealand river by tower excavator. The News also contains a list of Field Reports available on a variety of other installations.

Where to get: Sauerman Bros., Inc., Dept. E-23, 620 S. 28th Ave., Bellwood, Ill.

Subject: **Dump Bodies**

Content: An illustrated sales sheet contains construction features and detailed specifications of the Heil LH-11 and H-11 heavy duty dump bodies.

Where to get: The Heil Co., Body and Hoist Sales Div., Milwaukee 1, Wis.

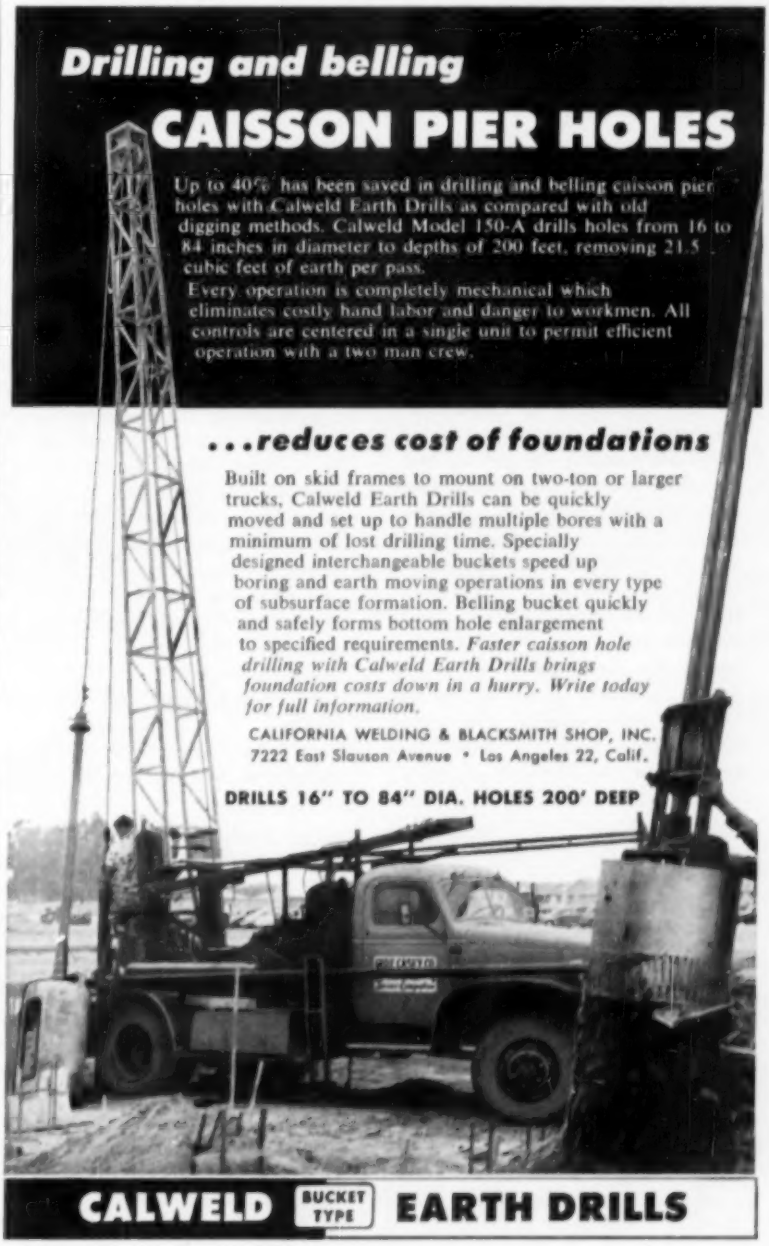
Subject: **Rubber Pipe Couplings**

Content: Booklet describes Tylox rubber joints for coupling pipe used in sewerage, drainage and other waterworks projects. Of special interest to engineers, contractors, municipal officials and others concerned with planning and building sewerage and drainage systems, this new brochure gives the history of the development of rubber pipe joints, and complete information and data on the first successful joint of this type.

Where to get: Hamilton Kent Mfg. Co., 427 West Grant St., Kent, Ohio.

Subject: **Legal Cases**

Content: *Legal Cases for Contractors, Architects, and Engineers* covers 52 situations in which these men might find themselves. Included are some recent cases covering subjects discussed in two previous volumes and bringing these matters up to date. Among the problems covered are the right to vary the quantities of the work called for by original plans and specifications, liquidated damages for delayed performance, and the admissibility of oral evidence to show that a written contract was not to take effect until the happening of a future event. All instances cited are actual cases which have been reported and which set forth or sustain the principle involved. The book is written to be easily understood by laymen as well as attorneys. Legal research on each point is thorough. Careful indexing and a complete table of cases cited make it convenient to use. Of


Drilling and belling
CAISSON PIER HOLES
Up to 40% has been saved in drilling and belling caisson pier holes with Calweld Earth Drills as compared with old digging methods. Calweld Model 150-A drills holes from 16 to 84 inches in diameter to depths of 200 feet, removing 21.5 cubic feet of earth per pass.
Every operation is completely mechanical which eliminates costly hand labor and danger to workmen. All controls are centered in a single unit to permit efficient operation with a two man crew.
...reduces cost of foundations
Built on skid frames to mount on two-ton or larger trucks, Calweld Earth Drills can be quickly moved and set up to handle multiple bores with a minimum of lost drilling time. Specially designed interchangeable buckets speed up boring and earth moving operations in every type of subsurface formation. Belling bucket quickly and safely forms bottom hole enlargement to specified requirements. Faster caisson hole drilling with Calweld Earth Drills brings foundation costs down in a hurry. Write today for full information.
CALIFORNIA WELDING & BLACKSMITH SHOP, INC.
7222 East Slauson Avenue • Los Angeles 22, Calif.
DRILLS 16" TO 84" DIA. HOLES 200' DEEP
CALWELD BUCKET TYPE EARTH DRILLS

course, the book is not intended to be a substitute for legal advice from an experienced attorney. The author, Mr. Vernon Werbin says, "If you find the matter in which you have become involved in one of these three books, it would be well to call it to the attention of your attorney." The other two books to which he refers are *Legal Phrases of Contracts* and *Legal Guide for Contractors, Architects,* and *Engineers*. The first discusses 46 legal problems that commonly arise out of construction contracts. The second examines 83 additional problems involved in engineering, architectural, and construction contracts. Price of the new, third volume is $6.

Where to get: McGraw-Hill Book Information Service, 327 West 41st St., New York 36, N. Y.

Subject: **Equipment Rental Rates**

Content: Associated Equipment Distributors, the national trade association of the construction equipment industry, announces that its 1955 (Seventh Edition) *Compilation of Rental Rates for Construction Equipment* is now available to the construction industry. Compiled and published for the information of construction equipment users everywhere, the 80-page book contains the national average rental rates for some 2,000 items of construction machinery and illustrates many of the major types of equipment. Rental rates appearing in the 1955 "Green Book," as it is popularly known in the industry, were established by an AED survey among the association's 700 United States distributor members. The survey and publication of the seventh edition compilation of rental rates were under the direction of AED's rental committee, headed by Theodore Hanau, Rental Service Co., Philadelphia, Pa. Other members of the committee include: H. T. Baker, W. T. Walsh Equipment Co., Cleveland, Ohio; N. E. De La Hunt, A. H. Cox & Co., Seattle, Wash.; and L. Miner Doolen (ex-officio), Telford Equipment Co., Lansing, Mich. The book is available at $5 per copy.

Where to get: Associated Equipment Distributors, 30 East Cedar St., Chicago 11, Ill.

Subject: **Parsons Trenchliner**

Content: A 2-color bulletin describes Parsons Company's newly designed Model 155 ladder-type Trenchliner and illustrates its minimum height and width clearance feature. Other features described in the recently published bulletin include the telescopic boom arrangement, reversible power-shift spoil conveyor and self cleaning tractor type crawlers.

Where to get: Parsons Co., Newton, Iowa.

Subject: **Cat Motor Grader**

Content: Costs of dirt haulers can be calculated easily, but motor grader cost hours are hard to determine, according to the booklet. Special features of the No. 12 motor grader are discussed. The booklet is also available in Spanish, French and Portuguese. Ask for Form DE540.

Where to get: Caterpillar Tractor Co., Peoria, Ill.

Subject: **Hydra-Boom**

Content: Ingersoll-Rand announces a new 12-page bulletin covering its complete line of hydraulic booms for use in the construction and mining industry. The new bulletin thoroughly covers Hydra-Boom applications, their advantages in construction work and in mining and tunneling. It contains information on booms mounted on tractors, tunnel jumbos and self-propelled air operated rigs. It also contains dimensioned coverage diagrams showing the area that can be covered by each boom, both vertically and horizontally as well as information on special Jumbo mountings including a four boom, self-propelled machine for drilling a face 40-feet high underground. Ask for form 4162.

Where to get: Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.

Subject: **Accident Facts**

Content: *Accident Facts* contains facts and figures on all types of accidents. Twenty of the 96 pages of the book are devoted exclusively to occupational accidents and provide the factual background necessary to give direction to an industrial safety program. There is a detailed list of accident rates by major industry groups, as well as charts showing the accident trend during the last 25 years. Most common source of injuries, part of body most frequently injured, off-the-job accident problems, unsafe acts and unsafe conditions contributing to permanent impairments and deaths, and other topics are included. Price is 75 cents a single copy and less for quantities.

Where to get: National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

Subject: **Electric Plants**

Content: A four-page folder illustrating and describing representative models in the manufacturer's line of electric plants is now available. Intended for use by distributors and dealers as a showroom folder or as a mailing piece, the 8½ x 11-in. publication is printed in two colors plus black. A chart detailing dimensions, weight and other technical data on various models is shown as well as a listing of nationwide branch sales offices where electric plant information is available.

Where to get: Kohler Co., Kohler, Wis.

New Movies . . .

Subject: **Good Highways**

Content: The need for good highways is the purpose of a 20-minute Caterpillar color film, *Road Block*. The film portrays the personal interest of the types of persons interested in good roads—the housewife, traveling salesman and farmer, among others. The objections these persons make are answered by a series of authorities whose comments are interjected without personal reference to the individual. The film points out that a program of good highways can succeed only through co-operative action.

Where to get: Caterpillar Tractor Co., Peoria 8, Ill.

Subject: **Highway Construction**

Content: A new 16 mm. sound color film entitled *The Long Street* deals with modern super highway construction. The film is a professional production employing skilled actors and is built around the story of a small town druggist who resists the construction of a new super highway near his community. Through his eyes the viewer sees how modern contractors tackle the problem of rock removal. He sees compressed air in action—operating all kinds of rock drills and other air operated tools as well as other construction equipment.

Where to get: Ingersoll-Rand Co. (Film Service Dept.), Phillipsburg, N. J.

BUCYRUS-ERIE TRANSIT CRANE

Does Double Duty for California Contractor

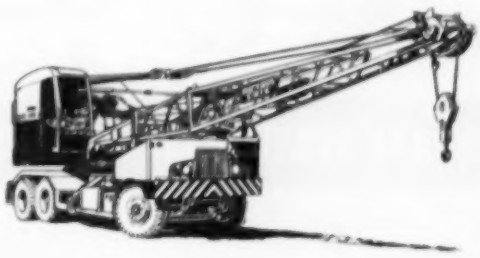
While J. Tomei and Sons Construction Co. were laying 5,000 feet of storm sewer pipe at Los Angeles International Airport, they were also working a road job at Palos Verdes 14 miles away. The Tomeis put a fast-moving 22-B Transit Crane to work servicing both projects.

From long experience, they knew that a Transit Crane's travel speed and quick, easy convertibility to shovel, dragline, clamshell, or dragshovel makes it ideal for multiple assignments.

A Transit Crane offers other outstanding features, too: friction swing brake to permit holding boom point over desired spots . . . power-controlled lowering for main hoist line . . . independent power boom hoist with power-controlled lowering . . . open-throat design for multiple-line rigging without removing sheave guards . . . 8- or 16-part pendant suspension for quick change of boom length . . . safety boom stops . . . and boom angle indicator.

These are all *standard features* on a Transit Crane — you pay nothing extra for the extra value. Investigate the profit-making Transit Crane soon. Your Bucyrus-Erie distributor has complete details on both the 25-ton 22-B and the 15-ton 15-B. 177E55C

Despite unstable, sandy footing, Tomei's 22-B Transit Crane handled 45- to 78-in. reinforced concrete pipe sections weighing up to 9½ tons, without difficulty. Operator Solem said he particularly liked the machine's ability to "boom down" with load, using the engine as a brake. He found this especially handy with heavy loads.



BUCYRUS ERIE
South Milwaukee Wisconsin

1880 75 1955
YEARS OF SERVICE
to Men Who Shape the Earth

Notes from the Manufacturers

American Tractor Corp., Churubusco (Fort Wayne), Ind., has announced creation of the position of export sales manager. Robert Fomberg has been named to fill the new post. He will be charged with setting up a world-wide TerraTrac distributor organization.

Clark Equipment Co. will establish a West Coast plant before the end of the year. The disclosure was made recently. The west coast facility will first be used as a parts depot and later will be expanded as an assembly plant for fork lift trucks. It will be located in the San Francisco Bay area. Complete stocks of service parts will be warehoused.

The Cooper-Bessemer Corp., Mount Vernon, Ohio, has announced that Lawrence F. Williams has been elected president of the corporation by its board of directors. By his election to the presidency, Mr. Williams succeeds Gordon Lefebvre who had previously resigned after 14 years of successful administration of the company. James E. Brown, treasurer of Cooper-Bessemer, was elected to serve also as secretary of the company, replacing Mr. Williams.

Electric Steel Foundry Co., Portland, Ore., has established ESCO International, a new division created to handle its export business. Main office of ESCO International is located in New York City under the direction of Ed T. Hewitt. Branch offices of ESCO International are located in Portland, Ore., and San Francisco, Calif. Foreign representatives and dealers are located in principal cities throughout the world.

L. B. Foster Co. has enlarged its new Atlanta office sales staff with the addition of Erskine Fraser as sales representative. He will handle sales of Foster steel sheet piling, pipe piling, steel pipe, rail and track accessories in the southeastern states. Mr. Fraser was formerly an engineer-estimator for R. F. Burton Co. and a bridge superintendent with W. J. Tidwell Co.

Galion Allsteel Body Co., Galion, Ohio, has appointed the South Texas Truck Equipment Co., Inc., 6 N. Latham, Houston, Tex., as distributor of Galion Allsteel products in Houston. The new distributor will maintain a complete stock of Galion dump bodies, hoists, LOAD-evator hydraulic end loaders and service parts. Appointment of Transportation Equipment Co., East St. Louis as distributor in southern Illinois and eastern Missouri was also announced. The new distributor, located at 1354 St. Clair ave., will provide complete maintenance and parts service together with body and hoist installation facilities. Atlas Truck Equipment & Bus Co., Milwaukee, has also been appointed as distributor. All of Wisconsin and the Upper Peninsula of Michigan will be covered by this distributor. Located at 126 S. Second St., Milwaukee, the new distributor will stock a complete line of Galion products. Complete parts, service and body mounting facilities are available.

Gardner-Denver Co., Quincy, Ill., has announced that Gifford V. Leece, president of Gardner-Denver Co., has been elected chairman of the executive committee to succeed Ralph G. Gardner, who recently retired as treasurer and head of the executive committee. Mr. Gardner continues as chairman of the company's board of directors and as a member of the executive committee. Alexander G. Lindquist, vice-president and formerly secretary and comptroller, has been named treasurer and a member of the executive committee. Charles M. George, assistant to the president, was elected secretary of the company, and William H. Miller was named assistant treasurer.

Gradall Division of The Warner & Swasey Co., Cleveland, Ohio, has appointed three new distributors: in San Francisco, Kansas City, and Duluth. The Western Traction Co., 2230 Third St., San Francisco, has been given the exclusive territory that in-

Continued on page 72

A PRODUCT OF EXPERIENCE!

Omaha Dragline Buckets are the product of more than forty-five years of bucket building experience. They have been field tested and proven on jobs of all kinds. You can't put a better bucket than an Omaha on any job. Write now for catalog giving complete information and specifications for the four types available.
OMAHA
DRAGLINE BUCKETS

DRAKE-WILLIAMS MOUNT • OMAHA, NEBR.

TO ADVERTISE: All advertising in this section is payable in advance. Rate: $1.00 per line, or $12.00 per inch of 12 lines. Minimum charge $4.00. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

LARGE SHOVELS, CRANES, DRAGLINES — 3 YDS. & UP

Bucyrus-Erie model 150-B Ward Leonard electric shovel, pushbutton starting, separately driven exciter, Tri-Ten dipper handle, available with six cubic yard rock dipper or special seven cubic yard dipper; serial no. 101329; shipped August 1953; excellent condition; location: South Dakota. Box 3598

Bucyrus-Erie 120-B shovel serial no. 37106 with two 5 yard dippers and spare long handle with 4 yard dipper; also includes about 2,000 feet power cable and a considerable quantity repair parts; good working condition; location State of Washington; price: $87,500. L. E. Dixon Company, 409 South California, San Gabriel, California.

SEE IT and make an offer

MARION No. 32

STEAM CRANE WITH PILE DRIVING LEADS

Serial No. 5672

COMPLETELY OVERHAULED
including Boiler check-up by manufacturer.

Equipped with 40 HP Steam Boiler. Westinghouse-Cross compound steam driven air compressor, 150 cu. ft. per min. @ 100# psi. Air receiver, fuel pump. Also available a Vulcan #1 pile hammer just overhauled. Subject to prior sale.

Tel. Cypress 2-4800

H. O. PENN MACHINERY CO., INC.
140th Street & East River
Bronx 51, New York

Lima 2400 dragline equipped with 110' boom, two 7-yard Hendrix HS buckets, one 6-yard ESCO bucket, Kohler light plant; machine powered with Caterpillar D-397 diesel engine and torque converter; 63" wide treads; long caterpillar frames; machine shipped September 1950; completely overhauled June 1955; engine completely overhauled April 1955; Approximately $5000 in spare parts available; Price, as is where is, $115,000. Box 3677

LARGE SHOVELS, CRANES, DRAGLINES — 3 YDS. & UP

SHOVELS DRAGLINES
TRACTORS DRILLS
TRUCKS

170-B B-E, 6 yd. electric shovel;
Lima 2400, 6 yd. diesel shovel;
Lima 2400, 4 yd. Hi-lift shovel;
Lima 1201, 3½ yd. diesel shovel;
54-B B-E 2½ yd. diesel shovel;
37-B B-E 1¼ yd. diesel shovel;
625 Page diesel walker 9-yd. 150' boom;
9-W B-E electric walker 8 yd. 200' boom;
2400 Lima, 5 yd. 130' dragline;
4500 Manitowoc 5 yd. 120' drag;
618 Page diesel walker 5 yd. 125' boom;
1201 Lima 85' boom, 3 yd. drag-crane;
3500 Manitowoc 2½ yd. 85' drag;
95 Northwest 2½ yd. 70' diesel dragline;
955 P&H 85' boom 2½ yd. diesel dragline;
2000 Manitowoc 1½ yd. diesel shovel;
K-480 Link Belt 80' 2 yd. diesel crane-drag; independent boom hoist;
604 Lima 65' boom 1½ yd. diesel dragline;
34T Lima, 20-ton truck crane;
255 PC P&H 20-ton truck crane 80' folding boom, 30' jib;
Model 25 Northwest truck crane;
58-BH Joy Champion rotary air drill;
2—DW-10 tractors and 12 yd. Athey side dump wagons;
2—520 Garwood 18 yd. scrapers;

Many good used trucks.

FRANK SWABB EQUIPMENT CO., INC.

313 Hazleton, Nat'l Bank Bldg.

Hazleton, Pa., Phone GLadstone 5-3658

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

Bucyrus-Erie model 22-B backhoes; 1954 GMC diesel $18,500; 1953 Int. diesel $14,500; 1950 Int. diesel $9,500; 310 Parsons Trenchey UD-18 diesel. A.C.R. Co., 19615 Nottingham Road, Cleveland 10, Ohio.

Marion 480' steam power shovel (2 cubic yard dipper) mounted on crawler; spare parts included; extra dipper bucket, sticks, treth, track shoes, boiler, sheaves, extra crowd, swing and hoist motors; shovel operative. Price: $5000 F.O.B. Cars in St. Louis area. Box 3678

CATERPILLAR DW10 DIESEL TRACTOR AND ATHEY 15 CU. YD. CAPACITY SIDE DUMP WAGON COMBINATION; used only 1700 hours; priced for quick sale at less than half price. J. P. Waite Construction Co., 3308 West Pierce St., Milwaukee 15, Wisconsin. Phone: EVergreen 4-1900.

MISCELLANEOUS EQUIPMENT

Six cubic yard dipper and Tri-Ten handle for Bucyrus-Erie 150-B Shovel; slightly used but in excellent condition. Box 3588

Two—New, "Goodyear" 24.00 x 29-18 ply low profile tires; Special Reduced Price: $1970., all F.O.B. Evansville, Indiana. Bucyrus-Erie Company, South Milwaukee, Wisconsin.

New 18" dredging pump, rectangular cross section casing, high alloy steel liners, high alloy cast steel 4 vane runner; spare liners. Box 3587

EQUIPMENT WANTED

Wanted: Used back-hoe attachment for TL20 Lorain machine; must be in good condition and at reasonable price. L. G. Eddy & Son, Contractors, 400 Kay Street, Hot Springs, Arkansas.

If you are Buying or Selling Used Equipment this is the place to let the Excavating Industry know about it.

Notes . . .

Continued from page 70

cludes the northern part of the state of California, including Fresno, Sacramento, and San Francisco. The Funkhouser Machinery Co., 2424 Jefferson St., Kansas City, has been assigned an exclusive territory that includes the state of Kansas east of and including the counties of Jewel, Mitchell, Lincoln, Ellsworth, Chase, Woodson, Wilson, and Montgomery, and the state of Missouri west of and including the counties of Putnam, Sullivan, Linn, Chariton, Howard, Cooper, Maniteau, Miller, Camden, Laclede, Wright, Douglas and Ozark. The Road Machinery & Supplies Co., 210-212 East First St., Duluth, Minn., will handle the entire state of Minnesota.

Harnischfeger Corp., Milwaukee, Wis., has appointed Robert H. Rand as Sales Engineer, Construction and Mining Division, for its Pittsburgh office. Mr. Rand attended Carnegie Tech and the University of Pittsburgh. He takes on this new assignment after 15 years of experience with distributors of power cranes and shovels.

The Heil Co., Milwaukee, Wis., has recently appointed Irvin F. Nelis Associates, Houston, Texas, as distributor for bodies and hoists, elevating tailgate units and related products manufactured by the company. Also named distributor of Heil truck bodies and hoists for west central Florida was Rivers Body Factory, P. O. Box 11146, Tampa, Florida. Its territory includes the counties of Levy, Citrus, Sumter, Lake, Hernando, Pasco, Hillsborough, Polk, Manatee, Hardee, Highlands, Sarasota, and DeSoto. The St. Louis Heil Equipment Co., 2002 Woodson Road, Overland, Mo., has recently been appointed the Heil distributor for east-central Missouri and the Illinois counties of Greene, Jersey, Macoupin, Madison, St. Clair, and Monroe.

Koehring Co., Milwaukee, Wis., announced that the first Canadian-built excavator was completed by Koehring-Waterous Ltd. The new excavator is rated in the 20-ton lift capacity class. Located in Brantford, Ont., the 100 year old Waterous firm was acquired in 1953 as a wholly owned subsidiary of the Koehring Co., of Milwaukee. Since then the firm has been identified as Koehring-Waterous Ltd. and its manufacturing activities have expanded to include fabrication of excavators and cranes in several sizes.

Macwhyte Co., Kenosha, Wis., has announced that its San Francisco warehouse has moved into new quarters at 188 King Street. A complete new building with facilities for handling, cutting, and shipping wire rope has been built. The company warehouse was formerly located at 141 King Street.

McKiernan-Terry Corp. has announced the appointment of R. H. (Dick) Nelson as assistant sales and service manager of the company's pile hammer division.

Morris Machine Works, Baldwinsville, N. Y., has announced two changes in sales territories. The Central Pennsylvania area is now handled by the Ramsay Pump and Supply Co., Pittsburgh. The Ramsay firm's entire territory for Morris now includes western Pennsylvania, eastern Ohio, and northern West Virginia. The representative in the Southeast Pennsylvania territory will be Maleson Co., Philadelphia.

Wooldridge Earthmoving Equipment Co., Sunnyvale, Calif., has announced appointment of three additional district representatives. Edward D. Wallace now represents the company in Minnesota, Wisconsin, Iowa, Illinois, Indiana, Ohio, Michigan and eastern Missouri. T. Robert Kyper is now serving in a similar capacity in Oklahoma, Kansas, Nebraska, Missouri and Arkansas. Representing Wooldridge in California, Nevada, Arizona, New Mexico, Utah and Colorado is Frank L. Johnson.

"Why didn't you let me know you were coming? . . . The house is a mess."

{PLEASE GIVE THIS ADVERTISEMENT TO YOUR BLASTING FOREMAN.}

Give Yourself the Best Break...

Start with the Right Primacord

PRIMACORD® is the registered trade mark brand name of all detonating fuse manufactured by The Ensign-Bickford Company. Controlled laboratory and field testing year after year has resulted in the development of many types of Primacord. For commercial blasting, the four types listed in the table below are recommended for use under the conditions shown:

CONDITIONS	*PRIMACORD RECOMMENDED*			
	Plain	*Rein-forced*	*Wire Countered*	*Plastic Reinforced*
Jackhammer holes	X			
Shallow well-drill holes	X			
Secondary blasting	X			
Deep, ragged holes		X	X	X
Extra deep holes			X	X
Deep, wet holes				X
When a field shot must stand a long time				X
River Crossings				X
Loading with heavily reinforced explosives containers			X	

For your Trunk Line, Plain Primacord serves in most cases. You can use Reinforced Primacord to advantage, especially where the going is rough.

When thunder storms threaten, or where high voltage cables may release stray electrical currents, always use Primacord. It is not affected by stray currents — and a direct hit by lightning failed to detonate it.

For more information see your Explosives Supplier, or write to

THE ENSIGN-BICKFORD COMPANY, Simsbury, Connecticut

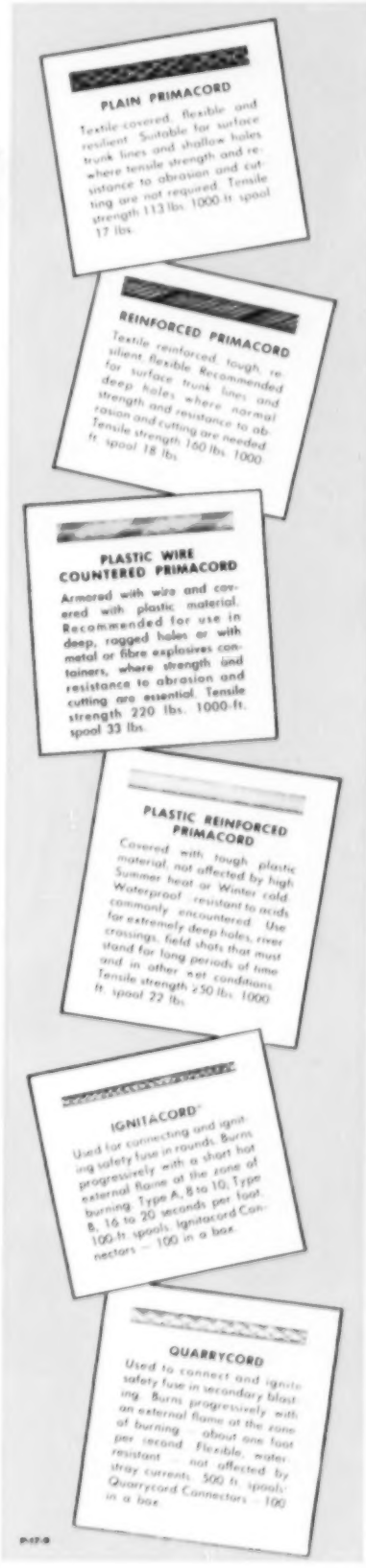
Primacord — Quarrycord — Ignitacord® — Safety Fuse — Blasting Accessories

Established 1836 P-17

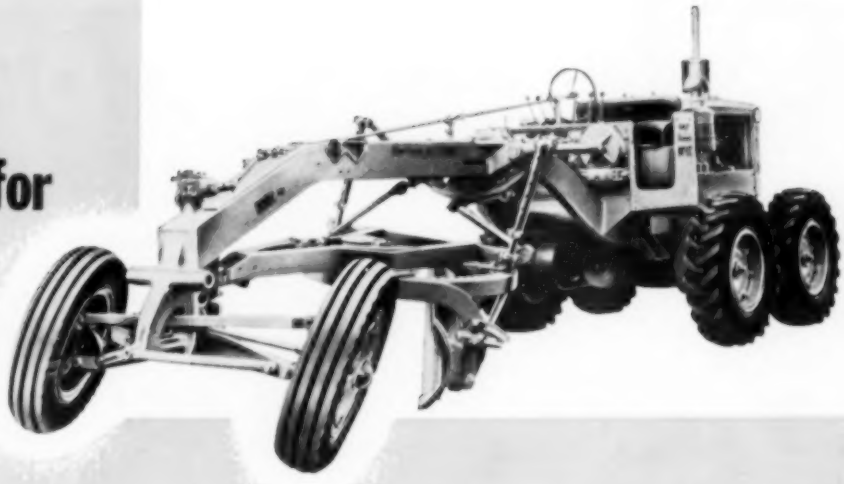
PRIMACORD®

DETONATING FUSE

PROVED AND APPROVED

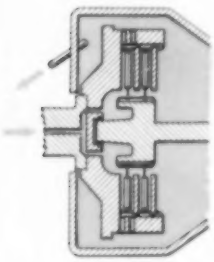

PLAIN PRIMACORD
Textile-covered, flexible and resilient. Suitable for surface trunk lines and shallow holes where tensile strength and resistance to abrasion and cutting are not required. Tensile strength 113 lbs. 1000-ft. spool 17 lbs.
REINFORCED PRIMACORD
Textile reinforced, tough, resilient, flexible. Recommended for surface trunk lines and deep holes where normal strength and resistance to abrasion and cutting are needed. Tensile strength 160 lbs. 1000-ft. spool 18 lbs.
PLASTIC WIRE COUNTERED PRIMACORD
Armored with wire and covered with plastic material. Recommended for use in deep, ragged holes or with metal or fibre explosives containers, where strength and resistance to abrasion and cutting are essential. Tensile strength 220 lbs. 1000-ft. spool 33 lbs.
PLASTIC REINFORCED PRIMACORD
Covered with tough plastic material, not affected by high Summer heat or Winter cold. Waterproof, resistant to acids commonly encountered. Use for extremely deep holes, river crossings, field shots that must stand for long periods of time and in other wet conditions. Tensile strength 250 lbs. 1000-ft. spool 22 lbs.
IGNITACORD®
Used for connecting and igniting safety fuse in rounds. Burns progressively with a short hot external flame at the zone of burning. Type A, 8 to 10, Type B, 16 to 20 seconds per foot. 100-ft. spools. Ignitacord Connectors — 100 in a box.
QUARRYCORD
Used to connect and ignite safety fuse in secondary blasting. Burns progressively with an external flame at the zone of burning, about one foot per second. Flexible, water-resistant — not affected by stray currents. 500 ft. spools. Quarrycord Connectors — 100 in a box.
P-17-D

Exclusive new oil clutch for CAT* No. 12 Motor Grader can give you

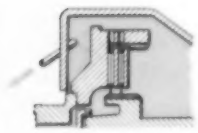


1500 HOURS without clutch adjustment

How the new oil clutch works



Crankcase oil is directed, under pressure, into clutch compartment through holes in flywheel. It is circulated by centrifugal force and returned to the crankcase by the flywheel ring gear. When the clutch is disengaged, cool oil surrounds the specially bonded cork facings.



As clutch discs move to engaged position, facings are "oil protected." Once engaged, they are completely free of oil.

Cork facings have a network of grooves that enable oil to escape during engagement. Oil constantly lubricates all moving parts.

Extensive tests have shown that clutch facings wear an average of only 2½ *thousandths of an inch per thousand hours of operation* with the new oil clutch for the Caterpillar No. 12 Motor Grader. Here are four good reasons why this new oil clutch can mean lower cost, better performance on *your* job:

1 LONG LIFE: new clutch facings greatly extend clutch life by reducing slippage. This is possible because of the high frictional qualities of the bonded cork facings. Since the clutch runs in oil, constant "oil bath" lubrication cuts wear on moving parts.

2 GREATER EFFICIENCY: clutch action stays smooth and "like new." Clutch "fade" due to overheating is practically eliminated, since facings are kept cool by engine oil.

3 EASY MAINTENANCE: nine months without clutch adjustment is not unusual in road maintenance work. Constant oil splash makes ordinary lubrication for clutch or throwout bearings unnecessary.

4 JOB PROVED: in exhaustive, on-the-job tests, this exclusive oil clutch in the No. 12 has delivered the same efficient, reliable performance as the thoroughly proved oil clutch on Caterpillar track-type Tractors.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

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99% OF ALL CAT MOTOR GRADERS ARE STILL IN USE